Subject: TEST REPORT
for
ML323-3 S/N 5
Diagnostic Testing

This report covers all testing accomplished to isolate the CCIG high voltage malfunction noted at Bendix Aerospace during thermal vacuum testing.

ML323-3 S/N 5 was shipped to Marshall Laboratories on 17 October 1968 from Bendix Aerospace Systems Division for diagnostic testing of the +4.5KV failure which occurred during thermal vacuum testing. (Ref. BxA DR#1477.)

A summary of the trouble shooting accomplished while the instrument was at Marshall Laboratories is as follows.

↑ Now Time Zero corp.

1.1 SUMMARY

This instrument experienced an apparent failure during the thermal vacuum testing at Bendix, Ann Arbor, Michigan. Word 2 at Side Frame No. 8, 40, 72 and 104 (which designates the +4.5KV A/D voltage) reads 000 (should read 226). The temperature at which this apparent failure occurred was below 10°C. The instrument was then returned to Marshall Laboratories for failure analysis.

This failure could not be reproduced after extensive testing and investigation.

1.2 PROCEDURES

The troubleshooting procedure was performed in the following manner:

1.2.1 Prior to any physical disassembly of the system, a system electrical test was performed with the lock-out plug engaged. There was no evidence of failure during this test.

1.2.2 Physical disassembly of the system was made in accordance with approved disassembly plans. (See attached assembly plans.)

1.2.3 A system electrical evaluation was then conducted with the lock-out plug removed. Both the -3.5KV and the +4.5KV were working perfectly.

1.2.4 Blivet 200, 600, 700 and 900 were then removed from the internal chassis.

1.2.5 Visual inspection of blivets 200, 600, 700 and 900 indicated no evidence of physical shorts.

1.2.6 Visual inspection of blivet 700 found that two module pins (Z702-Pin 2 and Z705-Pin 2) were nearly bonded to the hook-up board with conformal coating material.

1.2.7 The +4.5KV power supply functioned normally in subsystem tests of blivets 700 and 900 from -30°C to +50°C.

1.2.8 The +4.5KV power supply functioned normally in a system test from -30°C to +50°C with blivets 600, 700 and 900 connected outside of the internal chassis.

1.2.9 X-ray pictures were taken of the areas around module Z233-Pin 5 (+4.5KV A/D comparator input) at room temperature. The distance between the module pin and the ribbon in the matrix (which was suspected to be shorted) was approximately 12.5 mils.

1.2.10 X-ray pictures taken at the same location as step 1.2.9 at -30°C, showed the distance to be approximately 6.25 mils.

1.2.11 X-ray pictures taken at the same location as step 1.2.9 at +50°C, showed the distance to be approximately 12 mils.

1.2.12 Reassembly of the instrument was then performed per MSC/Rice instruction.

1.2.13 The instrument was then to be thermal vacuum tested at MSC on November 18, 1968. How long?

1.2.14 Eight (8) test points were brought out to monitor the +4.5KV power supply operation for the thermal vacuum test at MSC.

1.2.15 A system test was performed after all the test points were brought out.

1.2.16 Signals at all test points were normal.

1.2.17 The -3.5KV A/D sub-com read approximately 128 cross-talk noise.

1.2.18 The cross-talk noise in the -3.5KV A/D sub-com was found to pick-up by the special test adapter connecting between J15 and P15.

1.3 ANALYSIS AND CONCLUSION

1.3.1 Symptoms

The +4.5KV A/D sub-com read 000 when the apparent failure occurred. This apparent failure was repeatable in temperature cycle.

1.3.2 Analysis

The final analysis cannot be concluded at this time due to inability to reproduce the failure mode. However, the suspect areas are either in the +4.5KV power supply circuit or in the +4.5KV A/D voltage comparator.

During normal operation with the +4.5KV off, the +4.5 A/D sub-com usually reads approximately 60 counts cross-talk noise from the -3.5KV power supply. Therefore, the failure mode is believed to be related more to the +4.5KV A/D voltage comparator rather than to the +4.5KV power supply as of this evaluation.

1.3.3 Conclusion

No evidence of this failure could be duplicated after performing extensive visual, electrical and combined thermal tests. Therefore, no valid conclusion can be established at this time. Further investigation will be performed during thermal vacuum testing at MSC.

On 14 November 1968 the instrument was shipped to MSC for thermal vacuum testing per RAS-1016. The test was started on 18 November 1968 in Building 33, Chamber N. All procedures had previously been approved by MSC Quality Assurance.

A summary of the events which occurred at MSC is as follows.

1.0 A pre-pump down C/O was performed on 18 November 1968 and all data was found to be within specified limits.

1.1 The chamber door was closed and pumped down to $< 5 \times 10^{-6}$ Torr without cold walls.

1.2 The instrument was allowed to soak at $< 5 \times 10^{-6}$ Torr for a period of 24 hours and then an ambient temperature vacuum test performed as called out in RAS-1016 on 20 November 1968. All data was within specified limits with the exception of the following items:

11/18 → 11/25
7 to 8 days
Flat T/L

(A) SIDE frame (S.F.) 8, 40, 72 and 104 Analog Subcom read 000 when the + high voltage lock-out switch was opened. The reading should have been 219-233.

(B) SIDE frame 1, 3, 5, 7 and 9 Analog Subcom read 000 with the + high voltage on. This reading is an indication of pressure within the CCIG and should have been approximately 255 as the pressure was $\approx 2 \times 10^{-6}$ Torr.

1.4 After all possible engineering measurements were made testing was terminated for the night and a decision was made to vent the chamber on 21 November 1968 to disassemble the instrument for localizing of the two problem areas. A feed-back point in the 700 blivet was shorted to ground; therefore it was to be monitored continuously during disassembly.

2.0 The instrument was disassembled per RRRS #0001 while observing the short circuit in the 700 blivet. The short circuit remained until the last insulated screw which holds the side covers to the internal wrap was removed and it then disappeared. After determining that the screw was the cause of the short circuit, Marshall Laboratories was contacted and asked to examine another 700 blivet to ascertain which terminal the screw was shorting against. Their findings agreed with the diagnosis made by Stu Kan, then at MSC for the test. The screw was shortened by approximately 1/16 inch and re-installed. The short circuit could not be induced so a decision was made to reassemble the instrument using a shortened screw and to run a cold temperature vacuum test in order that a high level of confidence could be established.

How about the void left in the potting by using a short screw

2.1 The electrometer input connector from the CCIG was found to be disconnected as had been suspected by test personnel. It had apparently been left disconnected during reassembly by Marshall Laboratories. All test personnel were convinced that the loose connector had caused the CCGE malfunction noted in Paragraph 1.3 B of this report.

The instrument was re-assembled and placed in the vacuum chamber and another pre-pump-down checkout performed. The chamber was then closed and pump-down started again.

2.2 On 23 November 1968 at 0945 the ambient temperature vacuum test was completed with no discrepancies noted.

2.3 On 23 November 1968 at 1600 the +10°C vacuum test was completed with no discrepancies noted.

2.4 On 23 November 1968 at 1745 the 0°C vacuum test was completed with no discrepancies noted.

2.5 On 23 November 1968 at 2020 the -10°C vacuum test was completed with one (1) out of tolerance reading noted. The discrepancy was Velocity Filter S.F. 26 read 165, should have read 166-172. (Ref. DR/MRR 047)

2.6 On 23 November 1968 at 2220 the -20°C vacuum test was completed and again the only discrepancy was as mentioned in Paragraph 2.5 of this report.

2.7 On 24 November 1968 at 0030 the -30°C vacuum test was completed with the following discrepancies noted.

(A) The experiment drew excessive current when energized using fixed power, therefore, making it necessary to turn on with variable power.

(B) All velocity filter readings were out of specified limits (approximately 25 counts low).

(C) All L.E.C.P.A. readings were out of specified limits (approximately 25 counts low).

(D) Command #9 (A, D and E) turned off both the velocity filter and the L.E.C.P.A. stepping power supplies. It should have affected only the velocity filter stepping supply.

2.8 After checking back through data obtained during the temperature checks (internal thermistors in the experiment) it was determined that the malfunction had occurred sometime between 2320 and 2350 on 23 November 1968. The temperatures within the experiment at the time of malfunction were as follows:

Temperature #1	=	148°K
#2	=	- 30°C
#3	=	- 40°C
#4	=	- 29°C
#5	=	- 27°C
#6	=	- 37°C

3.0 Upon completion of the -30°C test the chamber was started slowly back to room temperature while the instrument was operated continuously to accelerate warm-up.

When the chamber temperature reached room ambient, the malfunction noted at -30°C had disappeared.

4.0 On 25 November 1968 the instrument was removed from the vacuum chamber and returned to Marshall Laboratories for analysis of the malfunction noted above. No results are yet available as to the cause of the malfunction.

CONCLUSION: The cause of the original malfunction has been located and fixed; however, more testing will be required to determine the cause of the malfunction which occurred at -30°C (Ref. Paragraph 2.7 of this report).

All units will have shorter screws installed in the 700 blivet problem area prior to flight.

If the mid is the problem all units are suspect!

NASA - MANNED SPACECRAFT CENTER
FAILURE INVESTIGATION ACTION REPORT

NO. AA-TD-00152

1. PROJECT	2. WHERE DETECTED: FACILITY	Organization	LOCATION	3. ORG. REPORT NO.	4. PROB. CLASSIF.	5. DATE REPORTED
APOLLO	Bendix	Aero Sys	AA--Mich	F152	☒ FAILURE ☐ UNSAT. COND.	9/28/68

6. CONTRACTOR	7. END ITEM NAME	8. ITEM UNDER TEST	9. NEXT ASSY. NAME	10. REPORTED ITEM
NA	ALSEP	Sub Pkg 1	NA	S.I.D.E.
11. TPS NUMBER	**7a. EI MODEL NO.**	**8a. CONTR. PART NO.**	**9a. CONTR. PART NO.**	**10a. CONTR. PART NO.**
NA	Flight 2	2334848	NA	2330660
12. ROUTING VIA	**7b. EI SERIAL NO.**	**8b. SUPPLIER PART NO.**	**9b. SUPPLIER PART NO.**	**10b. SUPPLIER PART NO.**
NA	6	NA	NA	NA
13. SPEC/PROCESS NO. DATE: 2333032 PARA: 6.7.4.10.2		**8c. SERIAL NO.** 5	**9c. SERIAL NO.** NA	**10c. SERIAL NO.** 5

14. COND.	15. CAUSE	16. SYMPT	17. Fail TYP	18. Detected During	19.	20. SYSTEM NAME	10d. Time/Cycles (ACUM)
						ALSEP	NA

21. DESCRIPTION OF FAILURE/CONDITION

During simulated lunar night and lunar morning, Attempts to turn on the S.I.D.E. high voltage were unsuccessful. Lunar noon operation was normal. (See DR# 1477)

22. CRITICALITY
3

23. INITIATOR/CONTACT	ORG.	DATE	24. [illegible]	ORG.	DATE
J.E.McGarth	BxA	10/7/68	MSC/SSM	TD2/E.Weeks	10/14/68

25. HARDWARE ANALYSIS REQUESTED/INSTRUCTIONS

MSC is responsible for failure analysis and corrective action.

ASSIGNED TO	ORG.	DATE	27. REQUESTER	ORG.	DATE
E.Weeks	TD2	10/14/68	NA		

28. CAUSE OF FAILURE/ANALYSIS RESULTS

29. SYSTEM ENGINEER	ORG.	DATE	30. RIE	ORG.	DATE

31. CORRECTIVE ACTION REQUESTED

32. ACTION ASSIGNED TO	ORG.	DATE	33. REQUESTER	ORG.	DATE

34. CORRECTIVE ACTION TAKEN

35. ACTION BY	ORG.	DATE	36. RIE	ORG.	DATE	37. CLOSE-OUT	DATE

MSC FORM 233 (JUL 66) PAGE OF

PART I – SHIPPING INFORMATION

TO: _____ (MAIL CODE)

Supply Service Center

Number _____

1. VOUCHER NO. *(Do not fill in)* 00077

2. DATE FORM PREPARED 11-21-69

3. FROM: *Originator's typed name, code and name of organization, and phone)*

E. L. [illegible], TRP, 3311

4. LOCATION OF PROPERTY TO BE PICKED UP

BUILDING	ROOM	PERSON & PHONE – IF OTHER THAN ORIGINATOR
32		

5. MATERIAL IS BEING SHIPPED *(Check one)*

☐ PERMANENTLY ☐ ON LOAN FOR _____ DAYS

6. SHIP *(Check one)*

☒ PREPAID ☐ COLLECT

7. APPLICABLE PROJECT AESP + Apollo

8. QUALITY CONTROL CHECKLIST *(Check each)*	YES	NO
A. MATERIAL IS ☒ FLIGHT/FLIGHT GSAE ☐ NONFLIGHT		
B. IS MATERIAL CLASSIFIED		X
C. IS SHIPPING LETTER ENCLOSED?		X
D. IS PARTS LIST ENCLOSED?		X
E. DOES MATERIAL REQUIRE SPECIAL HANDLING? *(e.g., delicate instruments)*	X	
F. IS MATERIAL CONSIDERED HAZARDOUS CARGO? *(If so, explain in remarks)*		X

G. PRESERVATION AND PACKAGING GUIDANCE. GUIDELINE MSC QAM 8.1 *(attach copy if available)*

8.105-3

9. APPROVALS

TYPED NAME AND SIGNATURE	DATE
DIVISION CHIEF [illegible], Manager, 1970	11-21-69
CONTRACTING OFFICER	
PROPERTY CUSTODIAN	
QUALITY CONTROL REPRESENTATIVE	

. REMARKS:

[illegible] CONTAINER

FORM 290 (REV. AUG. 67) PREVIOUS EDITIONS ARE OBSOLETE

PART II – SHIPPING DOCUMENT

FROM: NASA, Manned Spacecraft Center, Houston, Te

1. SHIP TO – MARK FOR *(INCLUDE ZIP CODE)*

[redacted]

Marshall Laboratories
3530 Torrance Blvd
Torrance, California

//[redacted] CARGO-[illegible]

2. APPROPRIATION AND FUNDING DATA

13. ITEM NO.	14. STOCK NUMBER OR PART NUMBER	15. ITEM NAME/MANUFACTURER *(also, MSC Inventory)*
1	60770-102	AESP/SI [illegible] Flight [illegible] BL 323-3
2		Accepted Data Package

(DO NOT FILL IN – TO BE COMPLETED BY SUPPLY)

20. RECAPITULATION OF SHIPMENT	ISSUED BY	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION
		3 [illegible]	[illegible]	[illegible]
	CHECKED BY	1	[illegible]	[illegible]
	PACKED BY			
		2	← TOTAL →	

Detached from MSC FORM 290 (Aug. 67)

PART II – SHIPPING DOCUMENT

ed Spacecraft Center, Houston, Texas 77058

ZIP CODE)

rnatics
Blvd
fornia

CARGO/PASSENGER MANIFEST RECORD//

DATA

SHEET NO.	NO. OF SHEETS	(Do not fill in Items 3 and 4) 3. MO.	DAY	YEAR	4. VOUCHER NO.
1					

5. DATE MATERIAL REQUIRED AT DESTINATION: 11-21-69

6. CONTRACT NUMBER: NAS 9-5211

(Do not fill in Items 7, 8, 9, & 10)

7. MODE OF SHIPMENT: HAND CARRY

8. DATE SHIPPED: 11/26/69

9. CONSIGNEE VOUCHER NO. AND DATE:

10. BILL OF LADING NO.

11. SIGNATURE OF ACCOUNTABLE PROPERTY OFFICER

12. AUTHORITY OR PURPOSE (Be specific): Result of hardware failure

BER BER	15. ITEM NAME/MANUFACTURER'S NAME AND SERIAL NO. (also, MSC Inventory No., if applicable)	16. UNIT OF ISSUE	17. QUANTITY SHIPPED	18. UNIT PRICE	19. TOTAL COST
	ASSY/SIM/MOSE Flight Unit No. 2 S/N 5 P/N 3[illegible]-3	EA	1		
	Accepted Data Package for the above	EA	1		

(DO NOT FILL IN – TO BE COMPLETED BY SUPPLY AND TRANSPORTATION BRANCH ONLY)

TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
1	[illegible]	22 x 22 x 31	10	2.7
1	[illegible]	32 x 32 x 32	25	3.0
2	TOTAL		35	5.7

15. RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	
POSTED	DATE	BY	

22. SHEET TOTAL

23. GRAND TOTAL

24. RECEIVER'S VOU NO. (Do not fill in)

INITIATOR (DO NOT RETAIN)

PLEASE PRESS HARD

17301

NCC 11-19-68

1. TYPE	A	Configuration Change		TEST PREPARATION SHEET NASA - MANNED SPACECRAFT CENTER	2. TPS No. SE8-1627
	B	Non-Configuration Change	X		3. S/C / Cat. / No.
Mod. Sheet Number					5. Page 1 of 2
6. S/C No./Model No.			7. Date 11-13-68	8. Time 1300	9. Need Date 12-9-68
10. Drawings, Documents, Ocp's, & Part Number(s) Chamber N SOP, Rice University & Marshall Lab Test Procedure					11. Contract Number 2-301 (4) 12. Serial Number
13. System Chamber N					14. Ref. E. O. Number
15. TPS Short Title Diagnostic Test of Cold Cathode Ion Gauge H.V. Power Supply.					16. Wt. Req.

17. Reason for Work:

To re-establish test conditions that caused prior failure of the high voltage power supply at Bendix Corporation.

	18. DESCRIPTION (Print or Type)	21. Tech.	Insp. 22. CONT.	Insp. 23. NASA
1.	Provide the following equipment on Chamber N:		11/18/68	
	a. 2 each 37 Pin Deutsch Feed Through Connectors			
	b. 2 each high voltage Feed Throughs, 5 KV or better.			
	c. 1 each 37 Pin Copper Constantan Thermocouple Feed Throughs			
	d. 1 each, 4 Pin Texas Instrument Recorder, calibrated for 0 - 10 MV span. Mark all divisions in degrees centigrade.			
	e. 1 each workbench 3' x 5' or equivalent.			
	f. 3, 115 V power outlets, 30 amp ratings.			
	G. 1 EACH 150° REFERENCE OVEN (SET @ 150°F).			
2.	Remove the grating plate from Chamber N to provide room to set the power supply.		11/18/68	
3.	Customer will install test article in chamber.		11/18/68	
4.	Assist customer personnel to hook up and ring out their test set up wiring per Figure 1.		11/18/68	

19. Prepared By R M Collins

20. Final Acceptance Date 11/22/68

REFER TO PROCEDURES FOR REQUIRED SIGNATURES		REFER TO PROCEDURES FOR REQUIRED SIGNATURES	
Contractor	Date	NASA	Date
F R Holt	11-14-68	W. A Barton	11-14-68

PLEASE PRESS HARD

TEST PREPARATION SHEET

CONTINUATION SHEET

NASA - MANNED SPACECRAFT CENTER

TPS No.	SE8-1627	
S/C	Cat.	No.

Page 2 of 2

	DESCRIPTION (Print or Type)	Tech.	Insp. Cont.	Insp. NASA
5	Pump down chamber per SOP #870.8 without cold walls. Record chamber pressure each 15 minutes. Record test article temperature continuously on TI Recorder; Log each 30 minutes.			11/20/65
6	Maintain chamber pressure without coldwalls at less than 5 x 10^{-6} torr for 24 hours. Assist customer personnel make measurements and record data per their test plan.			11/21/65
7	At NASA/SEEL and customer concurrence, start LN_2 cold wall operation. Assist in data recording as the temperature decreases to predetermined test points indicated on the TI Recorder. Print out LN_2 coldwall temperature each 15 minutes on PDS, Log temp, group 1, each 30 minutes.			
8	Shut off cold wall and return chamber to ambient temperature while maintaining vacuum.			
9	Repeat steps 7 & 8 at NASA/SEES request.			
10	Repeat step 9.			
11	Shut down chamber per SOP #870.8.			
12	Remove Test Article, (by customer only).			
13	Install grating removed in Step 2 and return chamber to original configuration.			
14	QC Coverage ~~III~~ Required.			

MSC FORM 1225A (JUL 64)

Copy 1

SHIPPING CONDITIONS

RECORDED BY P.H. Bailey

DATE RECVD. 11-18 1968

FROM ML

TO MSC

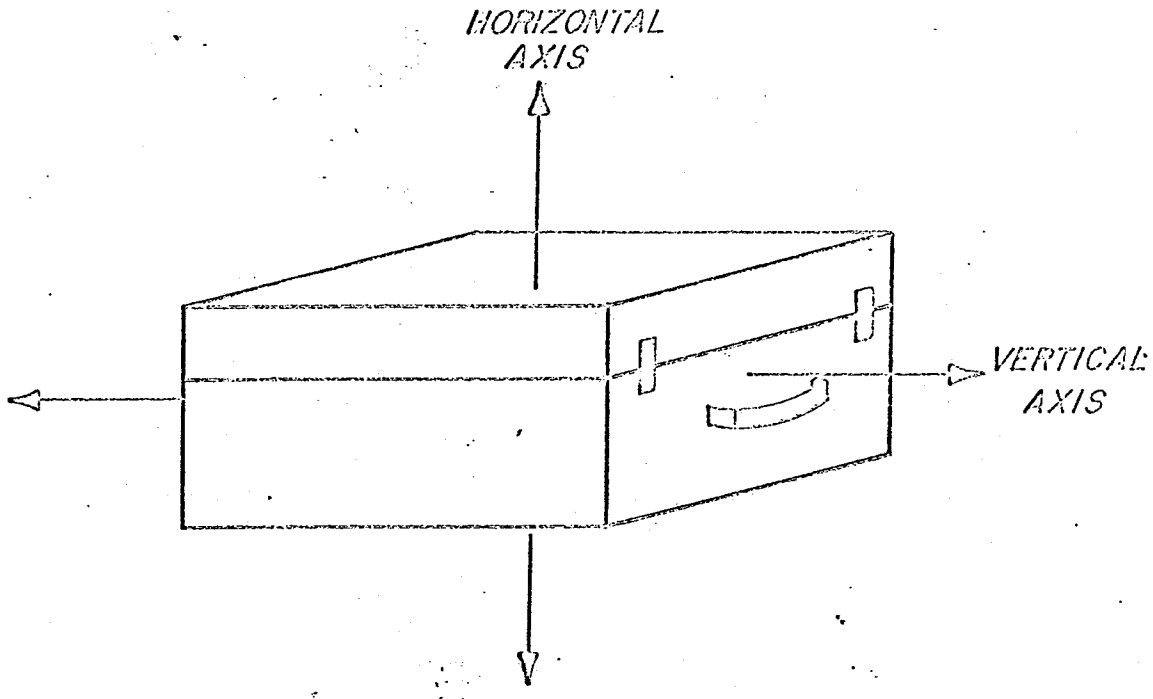
DATE SHIPPED 11-14 1968

WITNESS W.A. Smith

GOVERNMENT REP. Verrick

UNIT NOMENCLATURE: ML323-3

S/N: 5



HORIZONTAL 10 G's*

VERTICAL 5 G's*

TEMPERATURE

MAX 30 °C

MIN 22 °C

*METAL RING ON INSIDE WEIGHT IS INDICATOR

MODEL NUMBER 323-3

SERIAL NUMBER 5

ALSEP/SIDE CCGE

ACCEPTANCE DATA PACKAGE

RICE ENGINEER _____ DATE _____

RICE PROGRAM MGR _____ DATE _____

GOVT REP _____ DATE _____

DATE	LOCATION	OPERATING TIME				OPERATOR NAME	FUNCTION PERFORMED	ENVIRONMENTAL CONDITIONS	FAILURES EXPERIENCED	RESULTS
		ON	OFF	TOTAL	ACCUMULATIVE					
11-18-68	MSC	133.55	133.6	.05		P.M.B.	RAS 1016 Para. 4.2	Ambient	None	Okay
"	"	133.60	133.65	.05		"	Repeat "	"	"	"
11-18-68 11-25-68	"	133.65	148.5	14.85		P.M.B.	RAS 1016	Ambient to -30°C < 5X10-6 Torr	Ref. DR's	?

OPERATING TIME LOG

SYSTEM AND COMPONENT ..STORICAL RECORD

1. ITEM NAME	2. ITEM NUMBER	3. DRAWING NUMBER	4. MANUFACTURER	5. SERIAL NUMBER
Side Cover Panel	AL-323-3	LD9220-102	Marshall Labs	5

6. SYSTEM/SUBSYSTEM	7. PROJECT	8. LIFE LIMITS: TIME/CYCLES		9. EFFECTIVITY
	Apollo	OPERATING	STORAGE	4/4

10. SPECIAL HANDLING AND/OR SHIPPING INSTRUCTIONS
GSFC 2109 shipping Container AL-323-3 S/N 5

11. DATE	12. LOCATION	13. HISTORICAL EVENTS	14. TIME/CYCLES	15. QC STAMP
11/6/68	Code 324 Bldg 33	Received Bldg 33		
11/8/68	"	Performed Thermal Vacuum Test per TPS-SE 8-11271 16274-		
11/21/68	"	Engineering Item Instruction No. 1 of TPS-SE 8-11271 Rev. A (6207-2154) Serial Check Sheet 219-35		
11/21/68	"	Sub Test #35 Performed per TPS-TD2-1		
11/21/68	"	Double check per TPS-TD2-1		
11-21-68	"	Pressure Integrated in chamber A per Test per TPS-TD2-1		
11/25/68	"	Effective Area of U.S.U.T Velocity Film and Energy Curve Plate Analyzer mounted on S/C Spec Rel Memo's SCD-1-047 & 048		
11/25/68		Transfer To Marshall Labs Per use from 250		
11/25/68		OK TO ship		
12/2/68		SHIPPED TO Marshall Labs Huntsville, Ala.		

NSC FORM 772 (REV. JUL 67) (Previous editions are obsolete)

DISCREPANCY REPORT/MATERIAL REVIEW RECORD
NASA - MANNED SPACECRAFT CENTER

PAGE ____ OF ____

1. Category	2. Article Name	3. Drawing Number	4. Serial/Lot Number	5. RECORD NUMBER
CAT II				IDR
6. Contractor's Name	7. Contractor's Drawing Number	8. Contractor's Serial Number		DR/MRR
9. Supplier's Name	10. Supplier's Drawing Number	11. Supplier's Serial No.	12. Next Higher Assy.	

13. REF. Document No.	14. Spacecraft	15. Fault	16. Funct.	17. Cause/Origin	18. System	19. Disposition

DISCREPANCY

20. Initiator's Signature	21. Stamp Number	22. Organization and Location of Initiator	23. Date

DISPOSITION

24. MR Action Required? ☐ Yes ☐ No	25. Replacement Part Number	26. Retest Required ☐ Yes ☐ No	27. Retest Accept Date	28. FIAR Number

29. MRB Decision

- ☐ USE "AS IS"
- ☐ REPAIR
- ☐ REWORK
- ☐ SCRAP

INSTRUCTIONS

QC STAMP: CONT | NASA

30. DATE ____ FINAL ACCEPTANCE

MRB APPROVAL SIGNATURES

31. System Engineer (Contractor)	DATE	32. System Engineer (NASA)	DATE
33. Quality Control Rep. (Contractor)	DATE	34. Quality Control Rep. (NASA)	DATE
35. Program Office Rep. (Office Code)	DATE	36. Quality Engineer (NASA)	DATE

MSC FORM 2176 (AUG 66)

DISCREPANCY REPORT/MATERIAL REVIEW RECORD
NASA - MANNED SPACECRAFT CENTER

PAGE 1 OF

1. Category	2. Article Name	3. Drawing Number	4. Serial/Lot Number	5. RECORD NUMBER
Gen CD-1	Fitting	1009-700-102	5	IDR
	6. Contractor's Name	7. Contractor's Drawing Number	8. Contractor's Serial Number	DR/MRR 9115
	Grumman	n/a	n/a	
	9. Supplier's Name	10. Supplier's Drawing Number	11. Supplier's Serial No.	12. Next Higher Assy.
	n/a	n/a	n/a	n/a

13. REF. Document No.	14. Spacecraft	15. Fault	16. Funct.	17. Cause/Origin	18. System	19. Disposition
MSC-1016, MPS 370-1007	n/a	1	0.0.2	3000/2.0	2000	

DISCREPANCY

1. During base metal Penetrant inspection of S/N 700, 700 & 1011 Cond. 000, thread OD Area 219 - 333

20. Initiator's Signature	21. Stamp Number	22. Organization and Location of Initiator	23. Date
Ralph M Adams	2709	2202-Quality Control	11/21/68

DISPOSITION

24. MR Action Required?	25. Replacement Part Number	26. Retest Required	27. Retest Accept Date	28. FIAR Number
☐ Yes ☐ No	N/A	☑ Yes ☐ No	11-26-68	4A-TD-00152

29. MRB Decision
- ☐ USE "AS IS"
- ☑ REPAIR
- ☐ REWORK
- ☐ SCRAP

INSTRUCTIONS

A screw in the 700 blind caused a short circuit in the 700 blind bolt hole unit. Advanced the sizes 4-6 threads and retested. All data remain within specified limits during retest.

E. L. Wesson

Ref: Ltr. EA7 to Eng 8-1-67

Part 2.

QC STAMP

CONT	NASA
	11/26/68

30. DATE 11-26-68 FINAL ACCEPTANCE

MRB APPROVAL SIGNATURES

31. System Engineer (Contractor)	DATE	32. System Engineer (NASA)	DATE
33. Quality Control Rep. (Contractor)	DATE	34. Quality Control Rep. (NASA)	DATE
35. Program Office Rep. (Office Code)	DATE	36. Quality Engineer (NASA)	DATE

NSC FORM 2176 (AUG 66)

1. Category	DISCREPANCY REPORT/MATERIAL REVIEW RECORD NASA - MANNED SPACECRAFT CENTER	PAGE 1 OF
B.C.D-1		

2. Article Name	3. Drawing Number	4. Serial/Lot Number	5. RECORD NUMBER
Side Looker	609720-102	5	IDR
6. Contractor's Name	7. Contractor's Drawing Number	8. Contractor's Serial Number	DR/MRR 047
Marshall Labs	N/A	N/A	
9. Supplier's Name	10. Supplier's Drawing Number	11. Supplier's Serial No.	12. Next Higher Assy.
N/A	N/A	N/A	N/A

13. REF. Document No.	14. Spacecraft	15. Fault	16. Funct.	17. Cause/Origin	18. System	19. Disposition
ICA-S-1016	N/A	EC.1	023	922/22S	ECT	

DISCREPANCY

1. Para. 4.7 & 4.8, -10°C & -20°C, During the two temperature readouts side frame (SF) 26 out of Spec. TS 165, should be 166-167. This is during the Velocity Filter readout.

20. Initiator's Signature	21. Stamp Number	22. Organization and Location of Initiator	23. Date
Franklin Glaser	3771	K-EA-05 Bldg 33 (MDA)	11/23/68

DISPOSITION

24. MR Action Required? ☐ Yes ☐ No	25. Replacement Part Number	26. Retest Required ☐ Yes ☐ No	27. Retest Accept Date	28. FIAR Number

29. MRB Decision

- ☐ USE "AS IS"
- ☐ REPAIR
- ☐ REWORK
- ☐ SCRAP

INSTRUCTIONS

QC STAMP	
CONT	NASA

30. DATE FINAL ACCEPTANCE

MRB APPROVAL SIGNATURES

31. System Engineer (Contractor)	DATE	32. System Engineer (NASA)	DATE
33. Quality Control Rep. (Contractor)	DATE	34. Quality Control Rep. (NASA)	DATE
35. Program Office Rep. (Office Code)	DATE	36. Quality Engineer (NASA)	DATE

MSC FORM 2176 (AUG 66)

DISCREPANCY REPORT/MATERIAL REVIEW RECORD
NASA - MANNED SPACECRAFT CENTER

PAGE ____ OF ____

1. Category	2. Article Name	3. Drawing Number	4. Serial/Lot Number	5. RECORD NUMBER
GCD-1	Silc/OCGE	609710-102	5	IDR
	6. Contractor's Name: Marshall Labs	7. Contractor's Drawing Number: N/A	8. Contractor's Serial Number: 174	DR/MRR 0458
	9. Supplier's Name: N/A	10. Supplier's Drawing Number: N/A	11. Supplier's Serial No.: N/A	12. Next Higher Assy.: N/A

13. REF. Document No.	14. Spacecraft	15. Fault	16. Funct.	17. Cause/Origin	18. System	19. Disposition
RAS-1016	N/A	EC1	0015	922/228	EC1	

DISCREPANCY

1. Para 4.9.1. Low Energy Curve Plate Analysis steps 1-5 out of spec. LS 180, 140, 095, 058 & 017. Should be 204-310, 162-120, 122-132, 077-095 & 033-59.
2. Velocity Filter read out Steps 0-127

20. Initiator's Signature	21. Stamp Number	22. Organization and Location of Initiator	23. Date
Frank L Gleason	3711	EG44 SCC 33 (MD26)	11/25/68

DISPOSITION

24. MR Action Required? ☐ Yes ☐ No	25. Replacement Part Number	26. Retest Required ☐ Yes ☐ No	27. Retest Accept Date	28. FIAR Number

29. MRB Decision

- ☐ USE "AS IS"
- ☐ REPAIR
- ☐ REWORK
- ☐ SCRAP

INSTRUCTIONS

QC STAMP: CONT | NASA

30. DATE — FINAL ACCEPTANCE

MRB APPROVAL SIGNATURES

31. System Engineer (Contractor)	DATE	32. System Engineer (NASA)	DATE
33. Quality Control Rep. (Contractor)	DATE	34. Quality Control Rep. (NASA)	DATE
35. Program Office Rep. (Office Code)	DATE	36. Quality Engineer (NASA)	DATE

MSC FORM 2176 (AUG 66)

FAILURE/MALFUNCTION REPORT

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REPORT ONE PRIMARY (INDEPENDENT) FAILURE ONLY AND ASSOCIATED EFFECTS

NOTE: PORTION II TO BE FILLED IN BY TROUBLESHOOTER AND REPAIR-REWORK PERSONNEL.
PORTION III TO BE FILLED IN BY PROJECT RELIABILITY.
PORTION IV TO BE FILLED IN BY QUALITY ASSURANCE.

1 DATE OF FAILURE: DAY 23 MO NOV YEAR 65

REPORT NUMBER: 6

SYSTEM SET OR EQUIPMENT | 2 NAME: ALSEPSIDECCGE | 3 DRAWING NUMBER: 609770 | CHANGE LETTER: E | REVISION: 02 | 4 SERIAL NUMBER: 323-3 | 5 OPERATING TIME: 0/E | 6 STANDBY TIME: 0/E

7 FAILURE DISCOVERED DURING
- [ ] RECEIVING INSPECTION
- [ ] COMPONENT TEST
- [ ] DEMON TEST
- [ ] SUBSYSTEM TEST
- [X] SYSTEM TEST
- [ ] CALIBRATION
- [ ] COUNTDOWN
- [ ] FLIGHT
- [ ] OTHER

8 SITE OF FAILURE
- [X] ENVIRONMENTAL CHAMBER
- [ ] GENERAL TEST AREA
- [ ] BUILDUP TEST AREA
- [ ] LABORATORY AREA, ROOM
- [ ] VENDOR FACILITY
- [ ] FIELD
- [ ] OTHER

9 TEST PROCEDURE NUMBER: RASI016 | CHANGE LETTER | PARAGRAPH NUMBER: 3.9.1

10 LOG BOOK SECTION | PAGE | ENTRY

13 REPORTED BY: P. H. Bailey

14 EXTENSION: 1123

15 EQUIPMENT RESPONSIBILITY SIGNATURE AND DATE | DAY | MO | YEAR

PROJECT NUMBER: 37265

11 DESCRIPTION OF THE MANIFESTATIONS OF TROUBLE: SIDE/CCGE drew excessive current when energized using Fired power causing the Exp. Current meter to peg and blowing a Fuse.

12 COMMENTS ON THE APPARENT CAUSE OF TROUBLE

25 CAUSE OF FAILURE

ACTIVE DOWN TIME HOURS | 15 LOCALIZATION | 17 DISASSEMBLY | 18 ISOLATION | 19 INTERCHANGE | 20 REASSEMBLY | 21 ALIGNMENT | 22 TEST & CHECKOUT | 23 SECURING SPARES | 24 ADMINISTRATION

26 FAILURE DISPOSITION: [ ] PART REPLACEMENT [ ] PART REPAIRED [ ] ADJUSTMENT [ ] MODIFICATION [ ] OTHER

27 HOURS ON PRIMARY PART | 28 FAILURE DIAGNOSED BY | 37 REPAIRED BY | 34 SUPERVISOR | 39 DAY DATE MO YEAR | 40 RETEST BY [ ] PASSED [ ] FAILED

PART DATA	29 PART NAME	30 CIRCUIT SYMBOL	31 PART NUMBER	32 VENDOR/MFG. DATE	33 SERIAL NUMBER	34 SIGNATURE	35 DAY DATE MO YEAR
PRIMARY PART (INDEPENDENT)							
ASSOCIATED PART FAILURES (DEPENDENT)							

45 FAILURE ANALYSIS RECOMMENDED [ ] YES [ ] NO | PERFORM FAILURE ANALYSIS [ ] YES [ ] NO | 47 FAILURE ANALYSIS REPORT NUMBER | 48 FAILURE SEVERITY CRITICAL MAJOR MINOR | 49 RELIABILITY ENGINEER

41 PRIMARY PART PURCHASE ORDER NUMBER | 36 CROSS REFERENCE TO OTHER DOCUMENTS

42 DESTRUCTIVE ANALYSIS RECOMMENDED ACTION: [ ] YES [ ] NO | VERIFY FAILURE ONLY [ ] YES [ ] NO | 43 INITIATE ACTION: [ ] PR [ ] MRB [ ] OTHER | 44 QUALITY SIGNATURE | 46 CORRECTIVE ACTION ASSURED

201317

FAILURE/MALFUNCTION REPORT

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REPORT ONE PRIMARY (INDEPENDENT) FAILURE ONLY AND ASSOCIATED EFFECTS

NOTE: PORTION I TO BE FILLED IN BY TROUBLESHOOTER AND REPAIR-REWORK PERSONNEL.
PORTION II TO BE FILLED IN BY PROJECT RELIABILITY.
PORTION IV TO BE FILLED IN BY QUALITY ASSURANCE.

1 DATE OF FAILURE: DAY 23 MO NOV YEAR 66

REPORT NUMBER: 7

SYSTEM SET OR EQUIPMENT: 2 NAME: ALSEP'S IDEC CGE | 3 DRAWING NUMBER: 6097 70+102 | CHANGE LETTERS | REVISION | 4 SERIAL NUMBER: 3233 | 5 OPERATING TIME | 6 | 7 STANDBY TIME | 8

7 FAILURE DISCOVERED DURING:
- [ ] RECEIVING INSPECTION
- [ ] COMPONENT TEST
- [ ] BENCH TEST
- [ ] SUBSYSTEM TEST
- [X] SYSTEM TEST
- [ ] CALIBRATION
- [ ] COUNTDOWN
- [ ] FLIGHT
- [ ] OTHER

8 SITE OF FAILURE:
- [X] ENVIRONMENTAL CHAMBER
- [ ] GENERAL TEST AREA
- [ ] BUILDUP TEST AREA
- [ ] LABORATORY AREA, ROOM
- [ ] VENDOR FACILITY
- [ ] FIELD
- [ ] OTHER

9 TEST PROCEDURE NUMBER: RAS 10 16 | CHANGE LETTER | PARAGRAPH NUMBER: 4.9.1

10 LOG BOOK SECTION | PAGE | ENTRY

13 REPORTED BY: P. H. Bailey | 14 EXTENSION: 1123

15 EQUIPMENT RESPONSIBILITY SIGNATURE AND DATE: DAY | MO | YEAR

PROJECT NUMBER: 3 72 6 15

11 DESCRIPTION OF THE INDICATIONS OF TROUBLE: Command #9 (A, D, E) caused both the Vel. Filter and the L.E.C.P.H. to Turn off. Command #9 should only affect the Vel. Filter.

CONTENTS OF THE APPARENT CAUSE OF TROUBLE: L

25 CAUSE OF FAILURE:

ACTIVE DOWN TIME HOURS: 16 LOCALIZATION | 17 DISASSEMBLY | 18 ISOLATION | 19 INTERCHANGE | 20 REASSEMBLY | 21 ALIGNMENT | 22 TEST & CHECKOUT | 23 SECURING SPARES | 24 ADMINISTRATIVE

26 FAILURE DISPOSITION: PART REPLACEMENT | PART REPAIRED | ADJUSTMENT | MODIFICATION | OTHER

27 HOURS ON PRIMARY PART | 28 FAILURE DISCLOSED BY | 29 REPAIRED BY | 30 SUPERVISOR | 31 DAY DATE MO YEAR | 32 RETEST BY | PASSED | FAILED

PART DATA	29 PART NAME	30 CIRCUIT SYMBOL	31 PART NUMBER	32 VENDOR/MFR. DATE	33 SERIAL NUMBER	34 SIGNATURE	35 DAY DATE MO YEAR
PRIMARY PART (INDEPENDENT)							
ASSOCIATED PART FAILURES (DEPENDENT)							

42 FAILURE ANALYSIS RECOMMENDED: [ ] YES [ ] NO | PERFORM FAILURE ANALYSIS: [ ] YES [ ] NO | 47 FAILURE ANALYSIS REPORT NUMBER | 48 FAILURE SEVERITY: CRITICAL | MAJOR | MINOR | 39 RELIABILITY ENGINEER

41 PRIMARY PART PURCHASE ORDER NUMBER | 55 CROSS REFERENCE TO OTHER DOCUMENTS

42 CORRECTIVE ANALYSIS RECOMMENDED ACTION: [ ] YES [ ] NO | VERIFY FAILURE ONLY: [ ] YES [ ] NO | 43 INITIATE ACTION: [ ] PR [ ] MRB [ ] OTHER | 44 QUALITY SIGNATURE | 45 CONFIGURATION ACTION AGENCY

201317

1. TYPE				TEST PREPARATION SHEET NASA - MANNED SPACECRAFT CENTER	2. TPS No.	SE 8-1627	
	A	Configuration Change			3. S/C	Cat.	No.
	B	Non-Configuration Change	X				
Mod. Sheet Number					5. Page 1 of 1		
6. S/C No./Model No. 1 & 2			7. Date 11-13-63	8. Time	9. Need Date 11-13-63		
10. Drawings, Documents, Oop's, & Part Number(s) 10-9170-107, TPS SE 8-1627					11. Contract Number N/A		
					12. Serial Number SN 5		
13. System SIDE HATCH & COMPARTMENT					14. Ref. E. O. Number N/A		
15. TPS Short Title T/V TEST					16. Wt. Req.		
17. Reason for Work: ENGINEERING EVALUATION							

	18. DESCRIPTION (Print or Type)	21. Insp. Tech.	22. CONT.	23. NASA
1	REMOVE FROM MLDC PER PROCEDURE			
	CLOSE CABIN DUCTS AND			
3	INSTALL ON MLDC			
3,	INSTALL UNIT IN MLDC 33 ALTITUDE			
	CHAMBER			
4	MAKE TEST SET UP			
5	RUN TEST PER PROCEDURE No. ATS-7576			
6	REMOVE UNIT FROM CHAMBER			
7	SHIP TO Marshall Space Flight Center			

19. Prepared By	20. Final Acceptance Date 11/25/63
REFER TO PROCEDURES FOR REQUIRED SIGNATURES	REFER TO PROCEDURES FOR REQUIRED SIGNATURES

Contractor	Date	NASA	Date

MSC FORM 1225 (JUL 65)

Copy 5

1. TYPE: A Configuration Change ☐ / B Non-Configuration Change ☑

TEST PREPARATION SHEET

NASA - MANNED SPACECRAFT CENTER

2. TPS No. TDA - 1

3. S/C [illegible] Cat. [illegible] No. [illegible]

Mod. Sheet Number [illegible]

5. Page 1 of ____

6. S/C No./Model No. [illegible]

7. Date 11-21-66

8. Time 1410

9. Need Date

10. Drawings, Documents, Ocp's, & Part Number(s) 69770-1082, TI RIS 1046

11. Contract Number NAS 9-911

12. Serial Number SN 5

13. System [illegible]

14. Ref. E. O. Number [illegible]

15. TPS Short Title [illegible]

16. Wt. Req.

17. Reason for Work:

[illegible]

	18. DESCRIPTION (Print or Type)	21. Tech.	Insp. 22. CONT.	Insp. 23. NASA
1	[illegible]			
	[illegible]			
2	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
3.	[illegible]			
	[illegible]			
	[illegible]			
4	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			
	[illegible]			

19. Prepared By

20. Final Acceptance Date [illegible]

REFER TO PROCEDURES FOR REQUIRED SIGNATURES		REFER TO PROCEDURES FOR REQUIRED SIGNATURES	
Contractor	Date	NASA	Date
		[illegible]	[illegible]

MSC FORM 1225 (JUL 65)

Copy 5

TEST PREPARATION SHEET

CONTINUATION SHEET

NASA - MANNED SPACECRAFT CENTER

TPS No.	
S/C	Cat. / No.
Page	of

	DESCRIPTION (Print or Type)	Tech.	Insp. Cont.	Insp. NASA

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA GEN. REG. NO. 27
5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : NC3/Chief Quality Engineering Branch DATE: NOV 1 2 1968

FROM : TD2/Chief Lunar Surface Experiment Office

SUBJECT: Waiver of ALSEP Experiment Test Set ML - 324 Calibration Requirements for MSC SIDE Thermal Vacuum Tests.

A Thermal/Vacuum Test is scheduled at MSC for the Flight 2 S/N5 SIDE November 18, 1968 to December 6, 1968. This test is for the purpose of isolating the failure mode that occurred on the S/N5 SIDE at Bendix during Flight 2 T/V acceptance tests.

The exact nature of the failure at Bendix was an indication that the 4.5 KV circuit did not function under thermal vacuum conditions. No voltage rather than low voltage was indicated by the Bendix instrumentation.

The test at MSC is designed to subject the experiment to similar environmental conditions encountered at Bendix and induce the failure. Special instrumentation will be provided to determine experiment conditions if a failure occurs.

The Experiment Test Set measures internal SIDE parameters and will specifically be used to indicate a 4.5 KV failure. Slightly out of tolerance conditions will be noted during the test and documented but are not of significant importance to the test objective. The condition of prime interest is a go or no go indication on the 4.5 KV circuit.

The only test set available because of schedule committments is located at Bendix. The Bendix schedule permits use of the test set between November 18 and December 1, 1968 at MSC. Several units such as a scope, digital voltmeter, etc are included as part of the test set. The normal Quality Requirements would dicate recalibration of the test set subsequent to arrival at MSC.

This office requests a waiver of this calibration requirement because of the intended use of the test set as a go/no go device. A further consideration is that the S/N5 SIDE will be recalibrated at Rice University subsequent to the MSC test and prior to delivery at Bendix.

NOV 13 1968

This memo is a result of discussions with Ron Peterson of the Quality Engincering office. Please waive the calibration requirement by concurring as indicated below and returning to this office.

by Ausley B. Carraway

CONCURRENCE: NC-3

PREPARED P.H. Bailey	DATE 11 Nov 68	SPACE SCIENCE FACILITIES RICE UNIVERSITY HOUSTON, TEXAS	SPECIFICATION NO. RAS-1016
CHECKED P.H. Bailey	12 Nov 68		PAGE 1 OF 6
APPROVED W.L. Smith	12 Nov 68		DATE 11 Nov 68 / REVISION New
OTHER S.H. Johnson	12 Nov 68		
NC3 R.L. Peters	13 Nov 68		

TITLE

SPECIFICATION NO. RAS-1016

TEST PROCEDURE

for

DIAGNOSTIC VACUUM TESTING OF CCIG HIGH VOLTAGE POWER SUPPLY MALFUNCTION FOR ALSEP/SIDE/CCGE; ML323-3, SN5

under

NASA Contract Number NAS9-5911

1.0 SCOPE

1.1 General

This procedure establishes the testing sequence to be followed during diagnostic testing of ML323-3 S/N 5.

1.2 Objective

The objective of this procedure is to re-establish the test conditions experienced at Bendix during the time that the CCIG high voltage failed to operate in order that a failure mode identical to the one experienced at Bendix can be reproduced.

2.0 EQUIPMENT REQUIRED

2.1 Thermal Vacuum Chamber capable of maintaining a pressure of $< 5 \times 10^{-6}$ Torr and with liquid nitrogen (LN_2) cold walls.

2.2 ALSEP/SIDE/CCGE Experiment Test Set.

2.3 Singer Metrics Model ESH Electrostatic Voltmeter.

2.4 One (1) Deutsch 37-pin Feed-thru Connector.

2.5 Two (2) High Voltage (+4.5 kv and ret.) Feed-thru penetrations.

2.6 Approximately fourteen (14) Instrumentation Feed-thru penetrations.

2.7 Miscellaneous Peripheral Equipment per Figure 1.

2.8 3' x 5' Workbench with 115 vac, 60 cycle, 30 ampere outlets (6 each).

3.0 APPLICABILITY

This procedure is applicable to ML323-3 S/N 5 only. The responsibility and authority for any decisions regarding the requirements of this procedure shall be resolved by the Program Managers (Rice University and Marshall Laboratories).

3.1 Required Test Personnel

The following personnel are required for the performance of this procedure and are considered mandatory.

3.1.1 Vacuum Chamber Operator - MSC
3.1.2 Test Conductor - Rice University
3.1.3 QA Personnel - MSC

3.2 Optional Personnel

The following personnel may witness the performance of this procedure but their attendance is not considered mandatory.

3.2.1 Engineering Personnel

3.2.1.1 Rice University
3.2.1.2 Marshall Laboratories
3.2.1.3 MSC

3.2.2 QA Personnel

3.2.2.1 Rice University

3.3 Test Conductor

The test conductor shall be either the Assistant Project Manager or Project Manager for ALSEP/SIDE from Rice University.

3.4 Personnel Responsibility

3.4.1 The Test Conductor shall be responsible for the decision for continuation or stopping of the test sequence.

3.4.2 The test personnel operating the Thermal Vacuum Chamber shall record pressure, cold wall temperature, experiment current, and thermocouple indicator readout every half-an-hour as a minimum.

3.5 Calibration of Equipment

Calibration of the ETS (Paragraph 2.2) and the Electrostatic Voltmeter (Paragraph 2.3) has been waived for this test.

copy available

4.0 TEST SEQUENCE

4.1 Install the ALSEP/SIDE/CCGE in the Thermal Vacuum Chamber per constraints of RAS-1014 and insure that all connections are per Figure 1.

4.2 Energize all Experiment Test Set units and allow a one (1) minute warm-up period.

4.2.1 Insure that all lock-out switches are in the closed position.

4.2.2 Energize the SIDE/CCGE and the Digital Printer and allow it to complete one (1) cycle (S.F. 0-127) and then de-energize the SIDE/CCGE and the Digital Printer.

4.2.3 Insure that all data is within the limits specified in Table 1 prior to proceeding to Paragraph 4.3. If any readings are out-of-tolerance the Test Conductor shall determine whether or not the test shall continue.

4.3 Pump-Down Sequence

Copy of BRN procedure available

4.3.1 Close the chamber door and start pump-down per BRN Procedure 870.8; T.P.S. will identify applicable sections of the BRN procedure.

Note: Pump-down must be accomplished without use of the LN_2 cold walls as cryopumps.

4.3.2 When the pressure in the chamber has been maintained at $< 5 \times 10^{-6}$ Torr for twenty-four (24) hours proceed with Paragraph 4.4 of this procedure.

4.4 Energize the Digital Printer and then the SIDE/CCGE. Allow the SIDE/CCGE and Printer to run as long as required to complete Paragraph 4.4.1 thru 4.4.3.

4.4.1 Place the +H.V. lock-out switch in the open position and observe the Analog Subcom readout on SIDE Frame (S.F.) 8, 40, 72 or 104. Insure that the reading is within the limits 219-233.

4.4.2 Observe the reading on the electrostatic voltmeter Insure that the reading is +4.5 kv ± .9 kv.

4.4.3 If the +4.5 kv readout is not within specified limits measure and record the voltage readings at the following points.

A. +4.5 kv A/D Input T.P. 0.0 vdc_____

B. +4.5 kv Monitor T.P. 0.0 vdc_____

C. +4.5 kv Sub-Com T.P. 3.6 vdc_____

Note: At any time that an out-of-tolerance readout is observed on the +4.5 kv, test personnel shall consult with the Program Manager as to course of action to be taken.

4.4.4 Upon completion of the measurements specified in Paragraph 4.4 thru 4.4.3 of this procedure, place the +H.V. lock-out switch in the closed position and de-energize the Digital Printer. Insure that all readings are within the limits specified in Table 1 prior to proceeding with Paragraph 4.5 of this procedure. If any readings are out-of-tolerance the Test Conductor shall determine whether or not the test shall continue.

4.5 Start chamber cool-down and continue until the temperature as readout on the thermocouple indicator is +10°C ± 5°C.

4.5.1 Repeat Paragraph 4.4 thru 4.4.4.

4.6 Continue decreasing the temperature until the readout on the thermocouple indicator is 0°C ± 5°C.

4.6.1 Repeat Paragraph 4.4. thru 4.4.4.

4.7 Continue decreasing the temperature until the readout on the thermocouple indicator is -10°C ± 5°C.

4.7.1 Repeat Paragraph 4.4 thru 4.4.4.

4.8 Continue decreasing the temperature until the readout on the thermocouple indicator is -20°C ± 5°C.

4.8.1 Repeat Paragraph 4.4 thru 4.4.4.

4.9 Continue decreasing the temperature until the readout on the thermocouple indicator is -30°C ± 5°C.

4.9.1 Repeat Paragraph 4.4 thru 4.4.4.

4.10 Return chamber to room temperature.

4.10.1 Repeat Paragraph 4.4 thru 4.4.4.

4.11 If no failure has occurred in Paragraph 4.5 thru 4.9, repeat Paragraph 4.5 thru 4.10.

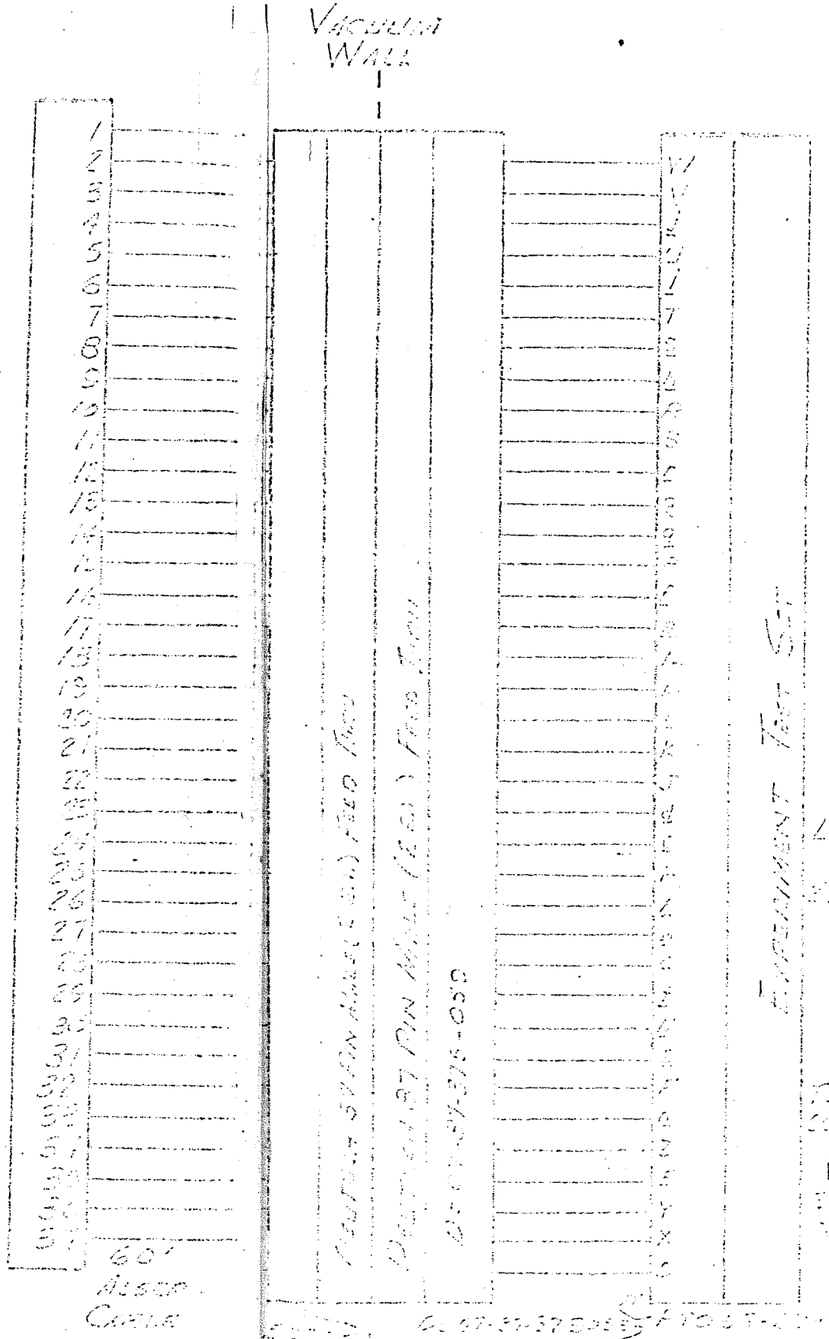
4.12 If no high voltage failure has occurred in Paragraph 4.11, repeat Paragraph 4.5 thru 4.10.

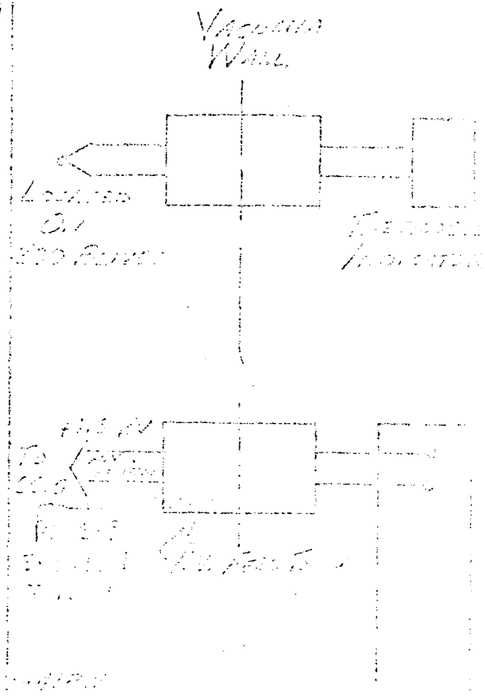
4.13 De-energize the SIDE/CCGE and the Experiment Test Set and start venting the vacuum chamber.

5.0 TEST CONCLUSION

5.1 Remove the SIDE/CCGE from the chamber per the constraints of RAS-1014 and return it to the shipping container.

The test results shall be analyzed and appropriate action taken by cognizant personnel prior to proceeding with any further testing program.


Vacuum Wall
Test Chamber
Instrumentation Test Rm
Equipment Test Set
60' Mission Cable
To Exc.


Vacuum Wall

PAGE 1

Diagnostic Test of Pulse Code Modulator

Time	Cond 1 Pressure		Temp °C	Cond 2 Pressure		Time	Cond 1 Pressure	Time	Cond 2 Pressure	
0300						0300		0300		
0315						0315		0315		
0330						0330		0330	2.2 X	10^{-5}
0345						0345		0345	2.2 X	10^{-5}
0400						0400		0400	2.1 X	10^{-5}
0415						0415		0415	1.9 X	10^{-5}
0430						0430		0430	1.9 X	10^{-5}
0445						0445		0445	1.9 X	10^{-5}
0500						0500		0500	1.8 X	10^{-5}
0515						0515		0515	1.7 X	10^{-5}
0530						0530		0530	1.7 X	10^{-5}
0545						0545		0545	1.7 X	10^{-5}
0600						0600		0600	1.7 X	10^{-5}
0615						0615		0615	1.7 X	10^{-5}
0630						0630		0630	1.7 X	10^{-5}
0645						0645		0645	1.7 X	10^{-5}
0700						0700		0700	1.7 X	10^{-5}
0715						0715		0715	1.7 X	10^{-5}
0730						0730		0730	1.7 X	10^{-5}
0745						0745		0745	1.7 X	10^{-5}
0800						0800		0800	1.7 X	10^{-5}
0815						0815		0815	1.7 X	10^{-5}
0830						0830		0830	1.7 X	10^{-5}
0845						0845		0845	1.7 X	10^{-5}
0900						0900		0900	1.7 X	10^{-5}
0915						0915		0915	1.7 X	10^{-5}
0930						0930		0930	1.7 X	10^{-5}
0945						0945		0945	1.7 X	10^{-5}
1000						1000		1000	1.7 X	10^{-5}
1015						1015		1015	1.7 X	10^{-5}
1030						1030		1030	1.7 X	10^{-5}
1045						1045		1045	1.7 X	10^{-5}
1100						1100		1100	1.7 X	10^{-5}
1115						1115		1115	1.7 X	10^{-5}
1130						1130		1130	1.7 X	10^{-5}
1145						1145		1145	1.7 X	10^{-5}
1200						1200		1200	1.7 X	10^{-5}
1215						1215		1215	1.7 X	10^{-5}
1230						1230		1230	1.7 X	10^{-5}
1245						1245		1245	1.7 X	10^{-5}
1300						1300		1300	1.7 X	10^{-5}
1315						1315		1315	1.7 X	10^{-5}
1330						1330		1330	1.7 X	10^{-5}
1345						1345		1345	1.7 X	10^{-5}
1400						1400		1400	1.7 X	10^{-5}
1415						1415		1415	1.7 X	10^{-5}
1430						1430		1430	1.7 X	10^{-5}
1445						1445		1445	1.7 X	10^{-5}
1500						1500		1500	1.7 X	10^{-5}
1515						1515		1515	1.7 X	10^{-5}
1530						1530		1530	1.7 X	10^{-5}
1545						1545		1545	1.7 X	10^{-5}
1600						1600		1600	1.7 X	10^{-5}
1615						1615		1615	1.7 X	10^{-5}
1630						1630		1630	1.7 X	10^{-5}
1645						1645		1645	1.7 X	10^{-5}
1700						1700		1700	1.7 X	10^{-5}
1715						1715		1715	1.7 X	10^{-5}
1730						1730		1730	1.7 X	10^{-5}
1745						1745		1745	1.7 X	10^{-5}
1800						1800		1800	1.7 X	10^{-5}
1815						1815		1815	1.7 X	10^{-5}
1830						1830		1830	1.7 X	10^{-5}
1845						1845		1845	1.7 X	10^{-5}
1900						1900		1900	1.7 X	10^{-5}
1915						1915		1915	1.7 X	10^{-5}
1930						1930		1930	1.7 X	10^{-5}
1945						1945		1945	1.7 X	10^{-5}
2000						2000		2000	1.7 X	10^{-5}
2015						2015		2015	1.7 X	10^{-5}
2030						2030		2030	1.7 X	10^{-5}
2045						2045		2045	1.7 X	10^{-5}

MSC FORM 644 (REV SEP 65) DATA SHEET

Diagnostic Test of Cold Cathode Gauge

11-19-68 & 11-20-68

Time	Gauge #1 Pressure	Temp °C	Gauge #2 Pressure	Time	Gauge #1 Pressure	Temp °C	Gauge #2 Pressure
1645	—		4.5×10^{-6}	0800	—	21.1°C	2.6×10^{-6}
1700	—	21.1°C	4.7×10^{-6}	0815	—	—	2.6×10^{-6}
1715	—	—	4.6×10^{-6}	0830	—	21.1°C	2.6×10^{-6}
1730	—	21.1°C	4.6×10^{-6}	0845	—	—	2.6×10^{-6}
1745	—	—	4.4×10^{-6}	0900	—	21.1°C	3.5×10^{-6}
1800	—	21.1°C	4.2×10^{-6}	0915	—	—	3.5×10^{-6}
1815	—	—	4.1×10^{-6}	0930	—	21.1°C	3.5×10^{-6}
1830	—	21.1°C	4.0×10^{-6}	0945	—	—	2.4×10^{-6}
1845	—	—	4.0×10^{-6}	1000	—	21.1°C	2.4×10^{-6}
1900	—	21.1°C	3.9×10^{-6}	1015	—	—	2.4×10^{-6}
1915	—	—	3.8×10^{-6}	1030	—	21.1°C	2.4×10^{-6}
1930	—	21.1°C	3.7×10^{-6}	1045	—	—	2.4×10^{-6}
1945	—	—	3.6×10^{-6}	1100	—	21.1°C	2.4×10^{-6}
2000	—	21.1°C	3.5×10^{-6}	0515	—	—	2.4×10^{-6}
2015	—	—	3.6×10^{-6}	0530	—	21.1°C	2.4×10^{-6}
2030	—	21.1°C	3.4×10^{-6}	0545	—	—	2.4×10^{-6}
2045	—	—	3.3×10^{-6}	0600	—	21.1°C	2.3×10^{-6}
2100	—	21.0°C	3.3×10^{-6}	0615	—	—	2.3×10^{-6}
2115	—	—	3.2×10^{-6}	0630	—	21.1°C	2.2×10^{-6}
2130	—	21.1°C	3.2×10^{-6}	0645	—	—	2.2×10^{-6}
2145	—	—	3.2×10^{-6}	0700	—	21.1°C	2.2×10^{-6}
2200	—	21.1°C	3.1×10^{-6}	0715	—	—	2.2×10^{-6}
2215	—	—	3.1×10^{-6}	0730	—	21.1°C	2.2×10^{-6}
2230	—	21.1°C	3.1×10^{-6}	0745	—	—	2.1×10^{-6}
2245	—	—	3.0×10^{-6}	0800	—	21.5°C	2.1×10^{-6}
2300	—	21.1°C	3.0×10^{-6}	0815	—	—	2.1×10^{-6}
2315		—	2.9×10^{-6}	0830	—	—	2.0×10^{-6}
2330		21.1°C	2.9×10^{-6}	0845	—	—	2.0×10^{-6}
2345		—	2.8×10^{-6}	0900	—	—	2.0×10^{-6}
0001	—	[illegible]	[illegible]	0915	—	—	2.0×10^{-6}
[illegible]		—	2.8×10^{-6}	0930	—	—	2.0×10^{-6}
[illegible]		[illegible]	[illegible]	0945	—	—	2.0×10^{-6}
[illegible]		—	[illegible]	1000	—	—	1.9×10^{-6}
[illegible]		[illegible]	[illegible]	1015	—	—	1.9×10^{-6}
[illegible]		—	[illegible]	1030	—	—	1.9×10^{-6}
[illegible]		[illegible]	[illegible]	1045	—	—	1.9×10^{-6}
[illegible]		—	[illegible]	1100	—	—	1.9×10^{-6}

Degas 9 hr 4 Start 24 hr stabilize

MSC FORM 644 (REV SEP 65) DATA SHEET

DIAGNOSTIC TEST OF COLD CATHODE GAUGE

11-20-68

Time	Gauge #1 Pressure		Temp. °C	Gauge #2 Pressure	Time	GP-71 Temp Gauge #1 Pressure		Temp °C	Gauge #2 Pressure
15	—	—	—	1.9 X 10-6	2030	—	—	—	2.2 X 10-6
30	—	—	—	1.9 X 10-6	2045	—	—	—	2.1 X 10-6
45	—	—	—	1.9 X 10-6	2100	—	—	—	2.0 X 10-6
00	—	—	—	1.9 X 10-6	2115	—	—	—	2.0 X 10-6
15	—	—	—	1.9 X 10-6	2130	—	—	—	2.0 X 10-6
30	—	—	—	1.9 X 10-6	2145	—	—	—	
45	—	—	—	1.8 X 10-6	2200	—	—	—	
00	—	—	—	1.8 X 10-6	2240	11-20-68 Burnt Test -			
15	—	—	—	1.8 X 10-6		Malfunction of Test Unit			
30	—	—	—	1.8 X 10-6					
45	—	—	—	1.7 X 10-6		11-21-68			
00	—	—	—	1.7 X 10-6	2100	—	—	—	3.6 X 10-5
15	—	—	—	1.7 X 10-6	2115	—	—	—	3.2 X 10-5
30	—	—	—	1.7 X 10-6	2130	—	—	—	2.9 X 10-5
45	—	—	—	1.7 X 10-6	2145	—	—	—	2.6 X 10-5
00	—	—	—	1.7 X 10-6	2200	—	—	—	2.4 X 10-5
15	—	—	—	1.7 X 10-6	2215	—	—	—	2.3 X 10-5
30	—	—	—	1.7 X 10-6	2230	—	—	—	2.1 X 10-5
45	—	—	—	1.7 X 10-6	2245				1.6 X 10-5
00	—	—	—	1.7 X 10-6	2300				1.4 X 10-5
15	—	—	—		2315				1.3 X 10-5
					2330				1.1 X 10-5
					2345				1.1 X 10-5
				1.5 X 10-6	0001				1.1 X 10-5
				1.5 X 10-6	0015				1.1 X 10-5
				1.5 X 10-6	0030				1.1 X 10-5
				1.5 X 10-6	0045				1.0 X 10-5
	GP-71 Temp			1.4 X 10-6	0100				9.1 X 10-6
				1.6 X 10-6	0115				8.6 X 10-6
				1.6 X 10-6	0130				8.2 X 10-6
				1.6 X 10-6	0145				7.8 X 10-6
				1.6 X 10-6	0200				7.4 X 10-6
				1.6 X 10-6	0215				7.2 X 10-6
				1.7 X 10-6	0230				6.8 X 10-6
				1.8 X 10-6	0245				6.6 X 10-6
				1.9 X 10-6	0300				6.4 X 10-6
				2.1 X 10-6	0315				6.1 X 10-6

DIAGNOSTIC TEST OF COLD CATHODE GAUGE

11-22-68

TIME			TEMP °C	GAUGE #2 PRESSURE	COMMENTS			TIME	°C Temp	PRESSURE GAGE #2	
0330			—	5.9 X	10-6			1245	22.7	2.5 X	10-6
0345			—	5.8 X	10-6			1300	22.7	2.5 X	10-6
0400			—	5.8 X	10-6			1315	22.7	2.5 X	10-6
0415			—	5.4 X	10-6			1330	22.7	2.4 X	10-6
0430			—	5.0 X	10-6	standard test		1345	22.7	2.3 X	10-6
0445			—	5.1 X	10-6			1400	22.7	2.3 X	10-6
0500			—	4.9 X	10-6			1415	22.7	2.3 X	10-6
0515			—	4.8 X	10-6			1430	22.7	2.3 X	10-6
0530			—	4.6 X	10-6			1445	22.7	2.3 X	10-6
0545			—	4.5 X	10-6			1500	22.7	2.2 X	10-6
0600			—	4.3 X	10-6			1515	22.7	2.1 X	10-6
0615			—	4.2 X	10-6			1530	22.7	2.1 X	10-6
0630			—	4.1 X	10-6			1545	22.7	2.1 X	10-6
0645			—	4.0 X	10-6			1600	22.7	2.1 X	10-6
0700			—	4.0 X	10-6			1615	22.7	2.0 X	10-6
0715			—	3.9 X	10-6			1630	22.7	2.0 X	10-6
0730			—	3.8 X	10-6			1645	22.7	1.9 X	10-6
0745			—	3.6 X	10-6			1700	22.7	1.9 X	10-6
0800			—	3.6 X	10-6			1715	22.7	1.8 X	10-6
0815			—	3.5 X	10-6			1730	22.7	1.9 X	10-6
0830			—	3.4 X	10-6			1745	22.7	1.8 X	10-6
0845			—	3.4 X	10-6			1800	22.7	1.8 X	10-6
0900			—	3.3 X	10-6			1815	22.7	1.8 X	10-6
0915			—	3.2 X	10-6			1830	22.7	1.7 X	10-6
0930			—	3.2 X	10-6			1845	22.7	1.7 X	10-6
0945			—	3.1 X	10-6			1900	22.7	1.7 X	10-6
1000			—	3.0 X	10-6			1915	22.7	1.7 X	10-6
1015			—	3.0 X	10-6			1930	22.7	1.6 X	10-6
1030			—	2.9 X	10-6			1945	22.7	1.7 X	10-6
1045			—	2.9 X	10-6			2000	22.7	1.6 X	10-6
1100			—	2.9 X	10-6			2015	22.7	1.6 X	10-6
1115			—	2.7 X	10-6			2030	22.7	1.6 X	10-6
1130			—	2.7 X	10-6			2045	22.7	1.6 X	10-6
1145			—	2.7 X	10-6			2100	22.7	1.6 X	10-6
1200			—	2.7 X	10-6			2115	22.7	1.6 X	10-6
1215			1.83 mv	2.6 X	10-6			2130	22.7	1.6 X	10-6
1230			22.7 C	2.5 X	10-6			2145	22.7	1.5 X	10-6

MSC FORM 644 (REV SEP 65) DATA SHEET

Diagnostic Test of Cold Cathode Gauge

11-22-68					11-23-68					
Time			Temp °C	Gauge Pressure	TIME			Temp °C	Gauge Pressure	LN2 shroud Temp
2200			22.7	1.5X10⁻⁶	0015			22.7	1.3 X10⁻⁶	
2215			22.7	1.5X10⁻⁶	0030			22.7	1.3 X10⁻⁶	
2230			22.7	1.5X10⁻⁶	0045			22.7	1.3 X10⁻⁶	
2245			22.7	1.5X10⁻⁶	0100				1.2X10⁻⁶	
2300			22.7	1.5X10⁻⁶	0115				1.1X10⁻⁶	
2315			22.7	1.5X10⁻⁶	0130				1.1X10⁻⁶	
2330			22.7	1.5X10⁻⁶	0145				1.0X10⁻⁶	
2345			22.7	1.5X10⁻⁶	0200				1.1X10⁻⁶	
2400			22.7	1.5X10⁻⁶	0215				1.1X10⁻⁶	
2415			22.7	1.5X10⁻⁶	0230				1.1X10⁻⁶	
0030			22.7	1.5X10⁻⁶	0245				1.1X10⁻⁶	
0045			22.7	1.5X10⁻⁶	0300				3.5X10⁻⁷	
0100			22.7	1.5X10⁻⁶	0315				3.2X10⁻⁷	
0115			22.7	1.5X10⁻⁶	0330			17.5	2.4X10⁻⁷	
0130			22.7	1.4X10⁻⁶	0345			16.6	2.4X10⁻⁷	
0145			22.7	1.4X10⁻⁶	0400			16.6	2.2X10⁻⁷	
0200			22.7	1.4X10⁻⁶	0415			16.5	2.2X10⁻⁷	
0215			22.7	1.4X10⁻⁶	0430			16.3	2.2X10⁻⁷	
0230			22.7	1.4X10⁻⁶	0445			16.3	2.2X10⁻⁷	
0245			22.7	1.4X10⁻⁶	0500			16.2	2.2X10⁻⁷	
0300			22.7	1.3X10⁻⁶	0515			15.9	2.2X10⁻⁷	
0315			22.7	1.3X10⁻⁶	0530			13.3	2.2X10⁻⁷	
0330			22.7	1.3X10⁻⁶	0545			13.3	2.2X10⁻⁷	
0345			22.7	1.3X10⁻⁶	0600			13.3	2.0X10⁻⁷	
0400			22.7	1.3X10⁻⁶	0615			13.3	1.9X10⁻⁷	
0415			22.7	1.3X10⁻⁶	0630			13.3	2.0X10⁻⁷	-041.1
0430			22.7	1.3X10⁻⁶	0645			13.3	1.9X10⁻⁷	-058
0445			22.7	1.3X10⁻⁶	0700			11.7	1.9X10⁻⁷	
0500			22.7	1.3X10⁻⁶	0715			11.0°C	1.8X10⁻⁷	
0515			22.7	1.3X10⁻⁶	0730			10.6°	1.9X10⁻⁷	-191.3
0530			22.7	1.3X10⁻⁶	0745			8.0°C	3.0X10⁻⁷	-204.7
0545			22.7	1.3X10⁻⁶	0800			8.0°C	2.2X10⁻⁷	-216.6
0600			22.7	1.3X10⁻⁶	0815			6.7°C	3.4X10⁻⁷	-230.4
0615			22.7	1.3X10⁻⁶	0830			5.5°C	3.0X10⁻⁷	-227.7
0630			22.7	1.3X10⁻⁶	0845			3.5°C	3.5X10⁻⁷	-228.5
0645			22.7	1.3X10⁻⁶	0900			2.7°C	4.1X10⁻⁷	-231.1
0700			22.7	1.3X10⁻⁶	0915			2.7°	6.0X10⁻⁷	-229.9

MSC FORM 644 (REV SEP 65) DATA SHEET

DIAGNOSTIC TEST OF COLD CATHODE GAUGE

TIME		C° Temp	Gauge H_2 Pressure		LN2 SHROUD Temp
1900		0° C	2.0	$X10^{-6}$	-230.2
1915		-1° C	2.4	$X10^{-6}$	-230.6
1930		-2.8° C	2.8	$X10^{-6}$	-230.5
1945		-3.3° C	2.8	$X10^{-6}$	-230.5
2000		-4.7° C	3.0	$X10^{-6}$	-230.5
2015		-6.4° C	3.1	$X10^{-6}$	-228.9
2030		-10.6	5.2	$X10^{-6}$	-232.2
2045		-11° C	4.0	$X10^{-6}$	-232.1
2100		-11.2° C	4.	$X10^{-6}$	-232.6
2115		-12.2° C	4.1	$X10^{-6}$	-232.8
2130		-13.3° C	4.3	$X10^{-6}$	-232.8
2145		-15.8° C	4.7	$X10^{-6}$	-232.9
2200		-16.7° C	1.6	$X10^{-6}$	-232.6
2215		-15.5	5.2	$X10^{-8}$	-233.6
2230		-19° C	4.9	$X10^{-8}$	-234.3
2245		-21.1° C	4	$X10^{-8}$	-235.8
2300		-23.4° C	3.8	$X10^{-8}$	-235.5
2315		-23.8° C	3.8	$X10^{-8}$	-235.3
2330		-24.2° C	3.6	$X10^{-8}$	-235.8
2345		-26.7° C	3.5	$X10^{-8}$	-235.6

SPACE SCIENCE FACILITIES — RICE UNIVERSITY HOUSTON, TEXAS

REWORK/REPAIR OR RETROFIT SEQUENCE

RRRS # 0001

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT MODEL	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
1	Remove experiment from carrying case per procedure RAS-1014, if applicable.	NA		
2	Remove experiment from plastic bag, if applicable.	NA		
3	Remove CCIG compartment cover and lanyard.	NA		
				TKTS-TDD-1
4	Remove ground screen wire screw from GS cap.	11-21-68	P.H.B	[illegible]
5	Disconnect ground screen wire.	11-21-68	P.H.B	
6	Install ground screen wire screw in GS cap.	11-21-68	P.H.B	
7	Remove bolt holding mounting tab post.	NA		
8	Remove cable reel.	NA		
9	Install mounting tab post bolt.	NA		
10	Remove CCIG from CCIG compartment	NA		
11	Install clamp on CCIG seal.	NA		
12	Remove experiment connector and place hardware in marked envelope	11-21-68	P.H.B	

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REWORK, REPAIR OR RETROFIT SEQUENCE

RRRS # 0001

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT MODEL	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
13	Disconnect experiment connector from cable reel.	11-21-68	P.J.B	[illegible]
14	Place cable reel in plastic bag.	NA		
15	Place cable reel in bonded stores	NA		
16	Remove lockout plug (P18) 609448.	11-21-68	P.J.B.	
17	Remove lockout (J18) connector from external case.	11-21-68	P.J.B	
18	Place lockout connector screws (2), lockwashers (2) and nuts (2) in marked envelope.	11-21-68	P.J.B.	
19	Remove leg pin and deploy legs.	NA		
20	Remove tie-down nuts on bottom of experiment.	11-21-68	P.J.B	
21	Place tie-down nuts (4) and lock-washers (4) in marked envelope.	11-21-68	P.J.B	
22	Stow legs and insert leg pin.	NA		
23	Loosen experiment positioning screws (6).	11-21-68	P.J.B.	
24	Remove external case/thermal spacer hardware.	11-21-68	P.J.B	

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REWORK, REPAIR OR RETROFIT SEQUENCE

RRRS # 0001

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT MODEL	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
25	Place EC/TS screws (18), lock-washers (18) and washers (18) in marked envelope.	11-21-68	P.W.B	Verified
26	Lift thermal spacer free of external case.	11-21-68	P.W.B	
27	Unwrap mylar tape and disconnect thermal spacer/internal package connector (P19/J19).	11-21-68	P.W.B	
28	Remove internal package from external case.	11-21-68	P.W.B	
29	Remove dust cover hinge to thermal spacer hardware.	NA		
30	Place dust cover hinge hardware -- screws (4), lockwashers (4) and washers (4) -- in marked envelope.	NA		
31	Remove side cover 609503-1; route to bonded stores.	11-21-68	P.W.B	
32	Place side cover hardware in marked envelope.	11-21-68	P.W.B	
33	Remove side cover 609502-1; route to bonded stores.	11-21-68	P.W.B	

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REWORK, REPAIR OR RETROFIT SEQUENCE

RRRS # 0001

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT MODEL	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
34	Place side cover hardware in marked envelope.	11-21-68	P.H.B	Verified
35	Install modified 609502-1 side cover for vacuum test only.	NA		
36	Install modified 609503-1 side cover for vacuum test only.	NA		
37	Reconnect thermal spacer/internal package connector.	NA		
38	Position thermal spacer over internal package and center using positioning screws.	NA		

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REWORK, REPAIR OR RETROFIT SEQUENCE

RRRS # 0005

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT UNIT	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
1	Loosen thermal spacer positioning screws.	NA		
2	Disconnect thermal spacer/ internal package connector.	NA		
3	Remove thermal spacer.	NA		
4	Remove modified 609503-1 side cover.			
5	Remove modified 609502-1 side cover.	NA		
6	Install 609502-1 side covers using hardware in marked envelope. Use locktite on all screws.	11-21-68	[illegible]	[illegible]
7	Install 609503-1 side covers using hardware in marked envelope. Use locktite on all screws.	11-21-68	[illegible]	[illegible]
8	Remove existing mylar tape wrap on CCIG cable.	NA		
9	Rewrap CCIG cable using mylar tape.	NA		

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REWORK, REPAIR OR RETROFIT SEQUENCE

RRRS # 0005

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT UNIT	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
10	Clean gold plated internal chassis and covers using freon solvent and soft cotton cloth. Replace gold tape as necessary.	NA		
11	Install new dust cover 609989-101A, using hardware in marked envelope, to thermal spacer.	NA		
12	Rework dust cover tab to fit solenoid latch.	NA		
13	Position dust cover, locktite dust cover screws and tighten screws.	NA		
14	Install internal package into external case.	11-21-68	PJH5	
15	Install the down rod hardware from marked envelope.	11-21-68	PJH3	
15A	Replace gold tape on interior of thermal spacer as necessary.	NA		
15B	Open dust cover and inspect second surface mirrors for damage. Replace as necessary per mirror criteria/MSC E. Smith letter.	NA		

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REWORK, REPAIR OR RETROFIT SEQUENCE

RRRS # 0005

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT UNIT	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
15C	Close dust cover.	NA		
16	Reconnect thermal spacer/ internal package connector and wrap with mylar tape.	11-21-68	PNB	
17	Install thermal spacer on external case using hardware in marked envelope. Locktite all screws.	11-21-68	PNB	
18	Adjust thermal spacer positioning screws and tie down rod nuts so no thermal shorts exist. Locktite hardware.	11-21-68	PNB	
19	Install lockout plug connector using hardware in marked envelope. Locktite screws.	11-21-68	PNB	
20	Install ground screen tube and ground screen tube retaining strap to external case. Locktite screws.	11-21-68	PNB	
21	Remove cable reel assembly from plastic bag.	NA		
22	Mate experiment connector to cable reel connector and locktite screws.	11-21-68	PNB	

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REWORK, REPAIR OR RETROFIT SEQUENCE

RRRS # 0005

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT UNIT	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
23	Install experiment connector into external case bracket and Locktite screws.	11-21-68	PJB	
24	Remove support post on mounting tab. Adjacent to reel stowage area on external case.	NA		
25	Install cable reel assembly in external case reel stowage area. Retain using reel clip.	NA		
26	Install support post on mounting tab adjacent to external case reel stowage area.	NA		
27	Locate and remove thermal paint epoxy with Epibond 1210 and bond Velcor Beta Fiberglas tape with teflon pile type 537 to thermal spacer per Drawing No. 609770-102A.	NA		
28	Install ground screen wire lug to ground screen cap.	11-21-68	PJB	
29	Install hardware to wire storage housing 609767-1 attaching housing to thermal spacer. Locktite all screws.	11-21-68	PJB	

SPACE SCIENCE FACILITIES
RICE UNIVERSITY HOUSTON, TEXAS

REWORK, REPAIR OR RETROFIT SEQUENCE

RRRS # 0005

PART NAME	PART NUMBER
ALSEP/SIDE/CCGE FLIGHT UNIT	609580
CONTRACT NUMBER	SERIAL NUMBER
NAS9-5911	ML 323-3 S/N 5

APPROVALS/DATE

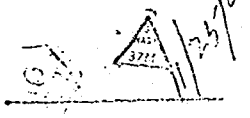
ENG.	DATE	QA	DATE	NASA/DCAS QAR	DATE

STEP	OPERATION	DATE COMPLETED	OPERATOR	INSPECTOR
30	Insert ground screen wire into wire storage housing.	11-21-68	PJB	
31	Insert lanyard latch pull-pin into latch. Attach lanyard to Velcro tape per Drawing No. 609770-102A.	NH		
32	Insert CCIG into external housing and adjust hold down bracket in place and lock at 5 in-lbs torque.	NH		
33	Install lockout plug 609448-101 (check for red tag).	11-21-68	PJB	
34	Install CCIG cable, lanyard and compartment cover.	NH		

TASK COMPLETION
CHECK OFF SHEET
for RAS-1016

TEMPERATURE CYCLE 1		CYCLE 1 Cont'd.		TEMPERATURE CYCLE 2	
Paragraph Number	T.C. Stamp	Paragraph Number	T.C. Stamp	Paragraph Number	T.C. Stamp
4.1		4.7		4.11	
4.2		4.7.1		(4.5	
4.2.1		(4.4		(4.5.1	
4.2.2		(4.4.1		(4.4	
4.2.3		(4.4.2		(4.4.1	
4.3		(4.4.3		(4.4.2	
4.3.1		(4.4.4		(4.4.3	
4.3.2		4.8		(4.4.4	
4.4		4.8.1		(4.6	
4.4.1		(4.4		(4.6.1	
4.4.2		(4.4.1		(4.4	
4.4.3		(4.4.2		(4.4.1	
4.4.4		(4.4.3		(4.4.2	
4.5		(4.4.4		(4.4.3	
4.5.1		4.9		(4.4.4	
(4.4		4.9.1		(4.7	
(4.4.1		(4.4		(4.7.1	
(4.4.2		(4.4.1		(4.4	
(4.4.3		(4.4.2		(4.4.1	
(4.4.4		(4.4.3		(4.4.2	
4.6		(4.4.4		(4.4.3	
4.6.1		4.10		(4.4.4	
(4.4		4.10.1		(4.8	
(4.4.1		(4.4		(4.8.1	
(4.4.2		(4.4.1		(4.4	
(4.4.3		(4.4.2		(4.4.1	
(4.4.4		(4.4.3		(4.4.2	
		(4.4.4			

TASK COMPLETION
CHECK OFF SHEET
for RAS-1016

CYCLE 2 Cont'd.		TEMPERATURE CYCLE 3		CYCLE 3 Cont'd.	
Paragraph Number	T.C. Stamp	Paragraph Number	T.C. Stamp	Paragraph Number	T.C. Stamp
(4.4.3		4.12		(4.4.3	
(4.4.4		(4.5		(4.4.4	
(4.9		(4.5.1		(4.9	
(4.9.1		(4.4		(4.9.1	
(4.4		(4.4.1		(4.4	
(4.4.1		(4.4.2		(4.4.1	
(4.4.2		(4.4.3		(4.4.2	
(4.4.3		(4.4.4		(4.4.3	
(4.4.4		(4.6		(4.4.4	
(4.10		(4.6.1		(4.10	
(4.10.1		(4.4		(4.10.1	
(4.4		(4.4.1		(4.4	
(4.4.1		(4.4.2		(4.4.1	
(4.4.2		(4.4.3		(4.4.2	
(4.4.3		(4.4.4		(4.4.3	
(4.4.4		(4.7		(4.4.4	
		(4.7.1			
		(4.4		*4.13	
		(4.4.1			
		(4.4.2		5.1	
		(4.4.3			
		(4.4.4			
		(4.8			
		(4.8.1			
		(4.4			
		(4.4.1			
		(4.4.2			

*This Operation to be completed at the discretion of the Test Conductor.

TABLE 1

MSC

Tested By J. H. Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.2					
	Experiment +60	N.A.	N.A.	218-224 (SF16)	220
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	214
	" - 5	N.A.	N.A.	211-217 (SF20)	214
	" -30	N.A.	N.A.	192-198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244-250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229-235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	206
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	180
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245-251 (SF15)	249
	" 17	N.A.	N.A.	232-238 (SF16)	235
	" 18	N.A.	N.A.	220-226 (SF17)	223
	" 19	N.A.	N.A.	201-207 (SF18)	204
	" 20	N.A.	N.A.	186-192 (SF19)	189
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	207
	" 2	N.A.	N.A.	162-170 (SF20)	166
	" 3	N.A.	N.A.	122-132 (SF40)	126

TABLE 1

Tested By P.H. BAILEY
MSC Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
7.2	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	045
	" 6	N.A.	N.A.	< 030 (SF100)	008
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	214
	" 2	N.A.	N.A.	207-213 (SF 1)	210
	" 3	N.A.	N.A.	203-209 (SF 2)	206
	" 4	N.A.	N.A.	199-205 (SF 3)	202
	" 5	N.A.	N.A.	195-201 (SF 4)	198
	" 6	N.A.	N.A.	191-197 (SF 5)	194
	" 7	N.A.	N.A.	185-191 (SF 6)	188
	" 8	N.A.	N.A.	181-187 (SF 7)	185
	" 9	N.A.	N.A.	176-182 (SF 8)	180
	" 10	N.A.	N.A.	171-177 (SF 9)	174
	" 11	N.A.	N.A.	165-171 (SF10)	168
	" 12	N.A.	N.A.	160-166 (SF11)	162
	" 13	N.A.	N.A.	155-161 (SF12)	157
	" 14	N.A.	N.A.	147-153 (SF13)	149
	" 15	N.A.	N.A.	139-147 (SF14)	142
	" 16	N.A.	N.A.	132-140 (SF15)	135
	" 17	N.A.	N.A.	126-134 (SF16)	128
	" 18	N.A.	N.A.	118-126 (SF17)	121
	" 19	N.A.	N.A.	112-120 (SF18)	116
	" 20	N.A.	N.A.	108-116 (SF19)	112
	" 21	N.A.	N.A.	189-195 (SF20)	193
	" 22	N.A.	N.A.	187-193 (SF21)	190
	" 23	N.A.	N.A.	183-189 (SF22)	186
	" 24	N.A.	N.A.	179-185 (SF23)	182
	" 25	N.A.	N.A.	175-181 (SF24)	178
	" 26	N.A.	N.A.	170-176 (SF25)	174
	" 27	N.A.	N.A.	166-172 (SF26)	168
	" 28	N.A.	N.A.	161-167 (SF27)	164
	" 29	N.A.	N.A.	155-163 (SF28)	159
	" 30	N.A.	N.A.	150-158 (SF29)	154
	" 31	N.A.	N.A.	144-152 (SF30)	148
	" 32	N.A.	N.A.	138-146 (SF31)	142 (?)

TABLE I

Tested By
MSC Quality Assurance
Govt. Representative P.H. BAILEY

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.2	VelFiltStep 34	N.A.	N.A.	126-134 (SF33)	129
	" 35	N.A.	N.A.	118-126 (SF34)	122
	" 36	N.A.	N.A.	112-120 (SF35)	115
	" 37	N.A.	N.A.	103-113 (SF36)	108
	" 38	N.A.	N.A.	097-107 (SF37)	101
	" 39	N.A.	N.A.	091-101 (SF38)	096
	" 40	N.A.	N.A.	087-097 (SF39)	092
	" 41	N.A.	N.A.	168-178 (SF40)	173
	" 42	N.A.	N.A.	166-172 (SF41)	169
	" 43	N.A.	N.A.	162-168 (SF42)	166
	" 44	N.A.	N.A.	159-165 (SF43)	162
	" 45	N.A.	N.A.	155-161 (SF44)	158
	" 46	N.A.	N.A.	149-157 (SF45)	153
	" 47	N.A.	N.A.	143-151 (SF46)	148
	" 48	N.A.	N.A.	140-148 (SF47)	144
	" 49	N.A.	N.A.	136-144 (SF48)	139
	" 50	N.A.	N.A.	130-138 (SF49)	134 (B)
	" 51	N.A.	N.A.	124-132 (SF50)	128 (A)
	" 52	N.A.	N.A.	118-126 (SF51)	122
	" 53	N.A.	N.A.	113-121 (SF52)	117
	" 54	N.A.	N.A.	104-114 (SF53)	109
	" 55	N.A.	N.A.	097-107 (SF54)	102
	" 56	N.A.	N.A.	090-100 (SF55)	095
	" 57	N.A.	N.A.	083-093 (SF56)	088
	" 58	N.A.	N.A.	075-087 (SF57)	081
	" 59	N.A.	N.A.	069-083 (SF58)	077
	" 60	N.A.	N.A.	066-080 (SF59)	072
	" 61	N.A.	N.A.	147-157 (SF60)	153
	" 62	N.A.	N.A.	144-154 (SF61)	149
	" 63	N.A.	N.A.	141-151 (SF62)	145
	" 64	N.A.	N.A.	137-147 (SF63)	141
	" 65	N.A.	N.A.	132-142 (SF64)	138
	" 66	N.A.	N.A.	128-138 (SF65)	133
	" 67	N.A.	N.A.	122-132 (SF66)	127

TABLE 1

Tested By MSC - Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.2	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	119
	" 70	N.A.	N.A.	109-119 (SF69)	113
	" 71	N.A.	N.A.	102-114 (SF70)	108
	" 72	N.A.	N.A.	096-108 (SF71)	102
	" 73	N.A.	N.A.	091-103 (SF72)	097
	" 74	N.A.	N.A.	083-095 (SF73)	089
	" 75	N.A.	N.A.	075-089 (SF74)	083
	" 76	N.A.	N.A.	067-083 (SF75)	075
	" 77	N.A.	N.A.	060-076 (SF76)	068
	" 78	N.A.	N.A.	051-071 (SF77)	062
	" 79	N.A.	N.A.	045-067 (SF78)	058
	" 80	N,A,	N.A.	041-063 (SF79)	054
	" 81	N.A.	N.A.	129-137 (SF80)	132
	" 82	N.A.	N.A.	125-133 (SF81)	129
	" 83	N.A.	N.A.	121-129 (SF82)	125
	" 84	N.A.	N.A.	118-126 (SF83)	122
	" 85	N.A.	N.A.	113-123 (SF84)	117 (R)
	" 86	N.A.	N.A.	108-118 (SF85)	113
	" 87	N.A.	N.A.	101-113 (SF86)	107
	" 88	N.A.	N.A.	097-109 (SF87)	104
	" 89	N.A.	N.A.	093-105 (SF88)	099
	" 90	N.A.	N.A.	087-099 (SF89)	093
	" 91	N.A.	N.A.	082-094 (SF90)	088
	" 92	N.A.	N.A.	075-089 (SF91)	082
	" 93	N.A.	N.A.	071-085 (SF92)	078
	" 94	N.A.	N.A.	059-077 (SF93)	070
	" 95	N.A.	N.A.	053-071 (SF94)	064
	" 96	N.A.	N.A.	043-065 (SF95)	055
	" 97	N.A.	N.A.	034-058 (SF96)	050
	" 98	N.A.	N.A.	026-056 (SF97)	043
	" 99	N.A.	N.A.	020-050 (SF98)	040
	" 100	N.A.	N.A.	014-050 (SF99)	036
	" 101	N.A.	N.A.	106-118 (SF100)	112
	" 102	N.A.	N.A.	102-114 (SF101)	109
	" 103				

TABLE 1

Tested By
MSC Quality Assurance
Govt. Representative P.H. BAILEY

Para. No.	Measurement Description	Analog Readings Predicted	Analog Readings Actual	Digital Readings Predicted	Digital Readings Actual
4.2	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	101
	" 105	N.A.	N.A.	090-114 (SF104)	097
	" 106	N.A.	N.A.	086-100 (SF105)	093
	" 107	N.A.	N.A.	080--094 (SF106)	087
	" 108	N.A.	N.A.	075--089 (SF107)	084
	" 109	N.A.	N.A.	070-086 (SF108)	077
	" 110	N.A.	N.A.	065-081 (SF109)	073
	" 111	N.A.	N.A.	059-075 (SF110)	069
	" 112	N.A.	N.A.	053-071 (SF111)	063
	" 113	N.A.	N.A.	046-066 (SF112)	058
	" 114	N.A.	N.A.	037-059 (SF113)	051
	" 115	N.A.	N.A.	027-055 (SF114)	044
	" 116	N.A.	N.A.	020-048 (SF115)	036
	" 117	N.A.	N.A.	010--044 (SF116)	031
	" 118	N.A.	N.A.	000--040 (SF117)	024
	" 119	N.A.	N.A.	000--036 (SF118)	022
	" 120	N.A.	N.A.	000--034 (SF119)	020
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	214
	" 122	N.A.	N.A.	" (SF121)	210
	" 123	N.A.	N.A.	" (SF122)	206
	" 124	N.A.	N.A.	" (SF123)	202
	" 125	N.A.	N.A.	" (SF124)	198
	" 126	N.A.	N.A.	" (SF125)	219
	" 127	N.A.	N.A.	" (SF126)	217
	" 128	N.A.	N.A.	" (SF127)	216

NOTE: "(R)" INDICATES READING ON "RE-RUN" TAPE. FIRST TAPE HAD ILLEGIBLE READINGS DUE TO PAPER BINDING IN PRINTER.

W.A. Smith

TABLE 1

Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4.4					
	Experiment +60	N.A.	N.A.	218-224 (SF16)	220
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	214
	" - 5	N.A.	N.A.	211-217 (SF20)	214
	" -30	N.A.	N.A.	192-198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244-250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229-235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	206
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	180
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245-251 (SF15)	249
	" 17	N.A.	N.A.	232-238 (SF16)	235
	" 18	N.A.	N.A.	220-226 (SF17)	223
	" 19	N.A.	N.A.	201-207 (SF18)	204
	" 20	N.A.	N.A.	186-192 (SF19)	189
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	207
	" 2	N.A.	N.A.	162-170 (SF20)	166
	" 3	N.A.	N.A.	122-132 (SF40)	126
	" 4	N.A.	N.A.	077-085 (SF60)	[illegible]

TABLE 1

Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4.4	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	046
	" 6	N.A.	N.A.	< 030 (SF100)	008
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	214
	" 2	N.A.	N.A.	207-213 (SF 1)	210
	" 3	N.A.	N.A.	203-209 (SF 2)	206
	" 4	N.A.	N.A.	199-205 (SF 3)	202
	" 5	N.A.	N.A.	195-201 (SF 4)	198
	" 6	N.A.	N.A.	191-197 (SF 5)	194
	" 7	N.A.	N.A.	185-191 (SF 6)	188
	" 8	N.A.	N.A.	181-187 (SF 7)	185
	" 9	N.A.	N.A.	176-182 (SF 8)	179
	" 10	N.A.	N.A.	171-177 (SF 9)	174
	" 11	N.A.	N.A.	165-171 (SF10)	168
	" 12	N.A.	N.A.	160-166 (SF11)	162
	" 13	N.A.	N.A.	155-161 (SF12)	157
	" 14	N.A.	N.A.	147-153 (SF13)	149
	" 15	N.A.	N.A.	139-147 (SF14)	143
	" 16	N.A.	N.A.	132-140 (SF15)	135
	" 17	N.A.	N.A.	126-134 (SF16)	128
	" 18	N.A.	N.A.	118-126 (SF17)	122
	" 19	N.A.	N.A.	112-120 (SF18)	116
	" 20	N.A.	N.A.	108-116 (SF19)	112
	" 21	N.A.	N.A.	189-195 (SF20)	193
	" 22	N.A.	N.A.	187-193 (SF21)	190
	" 23	N.A.	N.A.	183-189 (SF22)	186
	" 24	N.A.	N.A.	179-185 (SF23)	182
	" 25	N.A.	N.A.	175-181 (SF24)	178
	" 26	N.A.	N.A.	170-176 (SF25)	174
	" 27	N.A.	N.A.	166-172 (SF26)	168
	" 28	N.A.	N.A.	161-167 (SF27)	164
	" 29	N.A.	N.A.	155-163 (SF28)	159
	" 30	N.A.	N.A.	150-158 (SF29)	154
	" 31	N.A.	N.A.	144-152 (SF30)	148
	" 32	N.A.	N.A.	138-146 (SF31)	142
	" 33				

TABLE I

Date 20 NOV 1964
Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4.4	VelFiltStep 34	N.A.	N.A.	126-134 (SF33)	129
	" 35	N.A.	N.A.	118-126 (SF34)	122
	" 36	N.A.	N.A.	112-120 (SF35)	115
	" 37	N.A.	N.A.	103-113 (SF36)	108
	" 38	N.A.	N.A.	097-107 (SF37)	101
	" 39	N.A.	N.A.	091-101 (SF38)	096
	" 40	N.A.	N.A.	087-097 (SF39)	092
	" 41	N.A.	N.A.	168-178 (SF40)	173
	" 42	N.A.	N.A.	166-172 (SF41)	169
	" 43	N.A.	N.A.	162-168 (SF42)	166
	" 44	N.A.	N.A.	159-165 (SF43)	162
	" 45	N.A.	N.A.	155-161 (SF44)	158
	" 46	N.A.	N.A.	149-157 (SF45)	153
	" 47	N.A.	N.A.	143-151 (SF46)	147
	" 48	N.A.	N.A.	140-148 (SF47)	144
	" 49	N.A.	N.A.	136-144 (SF48)	139
	" 50	N.A.	N.A.	130-138 (SF49)	134
	" 51	N.A.	N.A.	124-132 (SF50)	128
	" 52	N.A.	N.A.	118-126 (SF51)	122
	" 53	N.A.	N.A.	113-121 (SF52)	117
	" 54	N.A.	N.A.	104-114 (SF53)	109
	" 55	N.A.	N.A.	097-107 (SF54)	102
	" 56	N.A.	N.A.	090-100 (SF55)	095
	" 57	N.A.	N.A.	083-093 (SF56)	088
	" 58	N.A.	N.A.	075-087 (SF57)	082
	" 59	N.A.	N.A.	069-083 (SF58)	077
	" 60	N.A.	N.A.	066-080 (SF59)	073
	" 61	N.A.	N.A.	147-157 (SF60)	153
	" 62	N.A.	N.A.	144-154 (SF61)	149
	" 63	N.A.	N.A.	141-151 (SF62)	145
	" 64	N.A.	N.A.	137-147 (SF63)	142
	" 65	N.A.	N.A.	132-142 (SF64)	137
	" 66	N.A.	N.A.	128-138 (SF65)	133
	" 67	N.A.	N.A.	122-132 (SF66)	127
	" 68				

TABLE 1

Tested By
Quality Assurance
Govt. Representative P. H. BAILEY

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4.4	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	119
	" 70	N.A.	N.A.	109-119 (SF69)	113
	" 71	N.A.	N.A.	102-114 (SF70)	108
	" 72	N.A.	N.A.	096-108 (SF71)	102
	" 73	N.A.	N.A.	091-103 (SF72)	097
	" 74	N.A.	N.A.	083-095 (SF73)	089
	" 75	N.A.	N.A.	075-089 (SF74)	083
	" 76	N.A.	N.A.	067-083 (SF75)	075
	" 77	N.A.	N.A.	060-076 (SF76)	068
	" 78	N.A.	N.A.	051-071 (SF77)	062
	" 79	N.A.	N.A.	045-067 (SF78)	057
	" 80	N,A,	N.A.	041-063 (SF79)	054
	" 81	N.A.	N.A.	129-137 (SF80)	132
	" 82	N.A.	N.A.	125-133 (SF81)	129
	" 83	N.A.	N.A.	121-129 (SF82)	125
	" 84	N.A.	N.A.	118-126 (SF83)	121
	" 85	N.A.	N.A.	113-123 (SF84)	117
	" 86	N.A.	N.A.	108-118 (SF85)	113
	" 87	N.A.	N.A.	101-113 (SF86)	107
	" 88	N.A.	N.A.	097-109 (SF87)	104
	" 89	N.A.	N.A.	093-105 (SF88)	099
	" 90	N.A.	N.A.	087-099 (SF89)	093
	" 91	N.A.	N.A.	082-094 (SF90)	088
	" 92	N.A.	N.A.	075-089 (SF91)	082
	" 93	N.A.	N.A.	071-085 (SF92)	078
	" 94	N.A.	N.A.	059-077 (SF93)	069
	" 95	N.A.	N.A.	053-071 (SF94)	063
	" 96	N.A.	N.A.	043-065 (SF95)	056
	" 97	N.A.	N.A.	034-058 (SF96)	049
	" 98	N.A.	N.A.	026-056 (SF97)	043
	" 99	N.A.	N.A.	020-050 (SF98)	040
	" 100	N.A.	N.A.	014-050 (SF99)	036
	" 101	N.A.	N.A.	106-118 (SF100)	112
	" 102	N.A.	N.A.	102-114 (SF101)	109
	" 103	N.A.	N.A.	098-111 (SF102)	105

TABLE 1

Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4.4	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	101
	" 105	N.A.	N.A.	090-114 (SF104)	097
	" 106	N.A.	N.A.	086-100 (SF105)	093
	" 107	N.A.	N.A.	080-094 (SF106)	087
	" 108	N.A.	N.A.	075-089 (SF107)	084
	" 109	N.A.	N.A.	070-086 (SF108)	079
	" 110	N.A.	N.A.	065-081 (SF109)	073
	" 111	N.A.	N.A.	059-075 (SF110)	068
	" 112	N.A.	N.A.	053-071 (SF111)	063
	" 113	N.A.	N.A.	046-066 (SF112)	059
	" 114	N.A.	N.A.	037-059 (SF113)	050
	" 115	N.A.	N.A.	027-055 (SF114)	045
	" 116	N.A.	N.A.	020-048 (SF115)	036
	" 117	N.A.	N.A.	010-044 (SF116)	032
	" 118	N.A.	N.A.	000-040 (SF117)	026
	" 119	N.A.	N.A.	000-036 (SF118)	023
	" 120	N.A.	N.A.	000-034 (SF119)	020
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	213
	" 122	N.A.	N.A.	" (SF121)	210
	" 123	N.A.	N.A.	" (SF122)	206
	" 124	N.A.	N.A.	" (SF123)	202
	" 125	N.A.	N.A.	" (SF124)	198
	" 126	N.A.	N.A.	" (SF125)	219
	" 127	N.A.	N.A.	" (SF126)	217
	" 128	N.A.	N.A.	" (SF127)	216

TABLE 1

Tested By R.H.B
Quality Assurance
Govt. Representative

Parg. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.2					
Repeat	Experiment +60	N.A.	N.A.	218-224 (SF16)	220
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	214
	" - 5	N.A.	N.A.	211-217 (SF20)	214
	" -30	N.A.	N.A.	192-198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244-250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229-235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	206
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	181
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245-251 (SF15)	249
	" 17	N.A.	N.A.	232-238 (SF16)	235
	" 18	N.A.	N.A.	220-226 (SF17)	223
	" 19	N.A.	N.A.	201-207 (SF18)	204
	" 20	N.A.	N.A.	186-192 (SF19)	189
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	207
	" 2	N.A.	N.A.	162-170 (SF20)	166
	" 3	N.A.	N.A.	122-132 (SF40)	126
	" 4	N.A.	N.A.	077-085 (SF60)	080

TABLE 1

Tested By _____
Quality Assurance _____
Govt. Representative _____

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.2 R	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	045
	" 6	N.A.	N.A.	< 030 (SF100)	006
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	213
	" 2	N.A.	N.A.	207-213 (SF 1)	210
	" 3	N.A.	N.A.	203-209 (SF 2)	206
	" 4	N.A.	N.A.	199-205 (SF 3)	202
	" 5	N.A.	N.A.	195-201 (SF 4)	198
	" 6	N.A.	N.A.	191-197 (SF 5)	194
	" 7	N.A.	N.A.	185-191 (SF 6)	188
	" 8	N.A.	N.A.	181-187 (SF 7)	185
	" 9	N.A.	N.A.	176-182 (SF 8)	180
	" 10	N.A.	N.A.	171-177 (SF 9)	174
	" 11	N.A.	N.A.	165-171 (SF10)	169
	" 12	N.A.	N.A.	160-166 (SF11)	162
	" 13	N.A.	N.A.	155-161 (SF12)	157
	" 14	N.A.	N.A.	147-153 (SF13)	149
	" 15	N.A.	N.A.	139-147 (SF14)	142
	" 16	N.A.	N.A.	132-140 (SF15)	135
	" 17	N.A.	N.A.	126-134 (SF16)	128
	" 18	N.A.	N.A.	118-126 (SF17)	121
	" 19	N.A.	N.A.	112-120 (SF18)	116
	" 20	N.A.	N.A.	108-116 (SF19)	112
	" 21	N.A.	N.A.	189-195 (SF20)	193
	" 22	N.A.	N.A.	187-193 (SF21)	190
	" 23	N.A.	N.A.	183-189 (SF22)	186
	" 24	N.A.	N.A.	179-185 (SF23)	182
	" 25	N.A.	N.A.	175-181 (SF24)	178
	" 26	N.A.	N.A.	170-176 (SF25)	174
	" 27	N.A.	N.A.	166-172 (SF26)	168
	" 28	N.A.	N.A.	161-167 (SF27)	164
	" 29	N.A.	N.A.	155-163 (SF28)	159
	" 30	N.A.	N.A.	150-158 (SF29)	154
	" 31	N.A.	N.A.	144-152 (SF30)	148
	" 32	N.A.	N.A.	138-146 (SF31)	142
	" 33	N.A.	N.A.	134-142 (SF32)	137

Date 11 Apr 86
Tested By
Quality Assurance
Govt. Representative

TABLE 1

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.2.2	VelFiltStep 34	N.A.	N.A.	126-134 (SF33)	129
	" 35	N.A.	N.A.	118-126 (SF34)	122
	" 36	N.A.	N.A.	112-120 (SF35)	115
	" 37	N.A.	N.A.	103-113 (SF36)	108
	" 38	N.A.	N.A.	097-107 (SF37)	101
	" 39	N.A.	N.A.	091-101 (SF38)	096
	" 40	N.A.	N.A.	087-097 (SF39)	092
	" 41	N.A.	N.A.	168-178 (SF40)	173
	" 42	N.A.	N.A.	166-172 (SF41)	169
	" 43	N.A.	N.A.	162-168 (SF42)	166
	" 44	N.A.	N.A.	159-165 (SF43)	162
	" 45	N.A.	N.A.	155-161 (SF44)	158
	" 46	N.A.	N.A.	149-157 (SF45)	154
	" 47	N.A.	N.A.	143-151 (SF46)	147
	" 48	N.A.	N.A.	140-148 (SF47)	144
	" 49	N.A.	N.A.	136-144 (SF48)	139
	" 50	N.A.	N.A.	130-138 (SF49)	134
	" 51	N.A.	N.A.	124-132 (SF50)	128
	" 52	N.A.	N.A.	118-126 (SF51)	122
	" 53	N.A.	N.A.	113-121 (SF52)	117
	" 54	N.A.	N.A.	104-114 (SF53)	109
	" 55	N.A.	N.A.	097-107 (SF54)	102
	" 56	N.A.	N.A.	090-100 (SF55)	095
	" 57	N.A.	N.A.	083-093 (SF56)	088
	" 58	N.A.	N.A.	075-087 (SF57)	081
	" 59	N.A.	N.A.	069-083 (SF58)	076
	" 60	N.A.	N.A.	066-080 (SF59)	072
	" 61	N.A.	N.A.	147-157 (SF60)	153
	" 62	N.A.	N.A.	144-154 (SF61)	149
	" 63	N.A.	N.A.	141-151 (SF62)	145
	" 64	N.A.	N.A.	137-147 (SF63)	141
	" 65	N.A.	N.A.	132-142 (SF64)	138
	" 66	N.A.	N.A.	128-138 (SF65)	133
	" 67	N.A.	N.A.	122-132 (SF66)	127
	" 68				

TABLE 1

Tested By _____
Quality Assurance _____
Govt. Representative _____

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.2.8	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	119
	" 70	N.A.	N.A.	109-119 (SF69)	113
	" 71	N.A.	N.A.	102-114 (SF70)	108
	" 72	N.A.	N.A.	096-108 (SF71)	102
	" 73	N.A.	N.A.	091-103 (SF72)	097
	" 74	N.A.	N.A.	083-095 (SF73)	089
	" 75	N.A.	N.A.	075-089 (SF74)	083
	" 76	N.A.	N.A.	067-083 (SF75)	015
	" 77	N.A.	N.A.	060-076 (SF76)	069
	" 78	N.A.	N.A.	051-071 (SF77)	062
	" 79	N.A.	N.A.	045-067 (SF78)	058
	" 80	N,A,	N.A.	041-063 (SF79)	053
	" 81	N.A.	N.A.	129-137 (SF80)	132
	" 82	N.A.	N.A.	125-133 (SF81)	129
	" 83	N.A.	N.A.	121-129 (SF82)	125
	" 84	N.A.	N.A.	118-126 (SF83)	121
	" 85	N.A.	N.A.	113-123 (SF84)	117
	" 86	N.A.	N.A.	108-118 (SF85)	113
	" 87	N.A.	N.A.	101-113 (SF86)	107
	" 88	N.A.	N.A.	097-109 (SF87)	104
	" 89	N.A.	N.A.	093-105 (SF88)	099
	" 90	N.A.	N.A.	087-099 (SF89)	093
	" 91	N.A.	N.A.	082-094 (SF90)	088
	" 92	N.A.	N.A.	075-089 (SF91)	082
	" 93	N.A.	N.A.	071-085 (SF92)	077
	" 94	N.A.	N.A.	059-077 (SF93)	070
	" 95	N.A.	N.A.	053-071 (SF94)	064
	" 96	N.A.	N.A.	043-065 (SF95)	055
	" 97	N.A.	N.A.	034-058 (SF96)	049
	" 98	N.A.	N.A.	026-056 (SF97)	043
	" 99	N.A.	N.A.	020-050 (SF98)	039
	" 100	N.A.	N.A.	014-050 (SF99)	036
	" 101	N.A.	N.A.	106-118 (SF100)	112
	" 102	N.A.	N.A.	102-114 (SF101)	109
	" 103	N.A.	N.A.	099-111 (SF102)	105

TABLE 1

Tested By
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	101
	" 105	N.A.	N.A.	090-114 (SF104)	097
	" 106	N.A.	N.A.	086-100 (SF105)	093
	" 107	N.A.	N.A.	080--094 (SF106)	087
	" 108	N.A.	N.A.	075--089 (SF107)	084
	" 109	N.A.	N.A.	070-086 (SF108)	079
	" 110	N.A.	N.A.	065-081 (SF109)	073
	" 111	N.A.	N.A.	059--075 (SF110)	069
	" 112	N.A.	N.A.	053-071 (SF111)	062
	" 113	N.A.	N.A.	046-066 (SF112)	058
	" 114	N.A.	N.A.	037-059 (SF113)	050
	" 115	N.A.	N.A.	027-055 (SF114)	045
	" 116	N.A.	N.A.	020-048 (SF115)	037
	" 117	N.A.	N.A.	010--044 (SF116)	031
	" 118	N.A.	N.A.	000-040 (SF117)	026
	" 119	N.A.	N.A.	000--036 (SF118)	022
	" 120	N.A.	N.A.	000--034 (SF119)	020
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	214
	" 122	N.A.	N.A.	" (SF121)	210
	" 123	N.A.	N.A.	" (SF122)	206
	" 124	N.A.	N.A.	" (SF123)	202
	" 125	N.A.	N.A.	" (SF124)	198
	" 126	N.A.	N.A.	" (SF125)	219
	" 127	N.A.	N.A.	" (SF126)	217
	" 128	N.A.	N.A.	" (SF127)	216

TABLE 1

Tested By P.H. Bates
Quality Assurance
Govt. Representative

Parg. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4					
Repeat	Experiment +60	N.A.	N.A.	218-224 (SF16)	220
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	214
	" - 5	N.A.	N.A.	211--217 (SF20)	214
	" -30	N.A.	N.A.	192--198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244--250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229--235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	206
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	180
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245--251 (SF15)	249
	" 17	N.A.	N.A.	232--238 (SF16)	235
	" 18	N.A.	N.A.	220--226 (SF17)	223
	" 19	N.A.	N.A.	201--207 (SF18)	204
	" 20	N.A.	N.A.	186--192 (SF19)	189
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	207
	" 2	N.A.	N.A.	162-170 (SF20)	166
	" 3	N.A.	N.A.	122-132 (SF40)	126
	" 4	N.A.	N.A.		

TABLE 1

Tested By R.H. Baker
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4.2	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	045
	" 6	N.A.	N.A.	< 030 (SF100)	006
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	214
	" 2	N.A.	N.A.	207-213 (SF 1)	210
	" 3	N.A.	N.A.	203-209 (SF 2)	206
	" 4	N.A.	N.A.	199-205 (SF 3)	202
	" 5	N.A.	N.A.	195-201 (SF 4)	198
	" 6	N.A.	N.A.	191-197 (SF 5)	194
	" 7	N.A.	N.A.	185-191 (SF 6)	188
	" 8	N.A.	N.A.	181-187 (SF 7)	185
	" 9	N.A.	N.A.	176-182 (SF 8)	180
	" 10	N.A.	N.A.	171-177 (SF 9)	174
	" 11	N.A.	N.A.	165-171 (SF10)	168
	" 12	N.A.	N.A.	160-166 (SF11)	162
	" 13	N.A.	N.A.	155-161 (SF12)	157
	" 14	N.A.	N.A.	147-153 (SF13)	149
	" 15	N.A.	N.A.	139-147 (SF14)	142
	" 16	N.A.	N.A.	132-140 (SF15)	135
	" 17	N.A.	N.A.	126-134 (SF16)	128
	" 18	N.A.	N.A.	118-126 (SF17)	121
	" 19	N.A.	N.A.	112-120 (SF18)	116
	" 20	N.A.	N.A.	108-116 (SF19)	112
	" 21	N.A.	N.A.	189-195 (SF20)	193
	" 22	N.A.	N.A.	187-193 (SF21)	190
	" 23	N.A.	N.A.	183-189 (SF22)	186
	" 24	N.A.	N.A.	179-185 (SF23)	182
	" 25	N.A.	N.A.	175-181 (SF24)	178
	" 26	N.A.	N.A.	170-176 (SF25)	174
	" 27	N.A.	N.A.	166-172 (SF26)	168
	" 28	N.A.	N.A.	161-167 (SF27)	164
	" 29	N.A.	N.A.	155-163 (SF28)	159
	" 30	N.A.	N.A.	150-158 (SF29)	154
	" 31	N.A.	N.A.	144-152 (SF30)	148
	" 32	N.A.	N.A.	138-146 (SF31)	142
	" 33				

Date 12 NOV 68

Tested By P.H. Ball 65

Quality Assurance

Govt. Representative

TABLE 1

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4c	VelFiltStep 34	N.A.	N.A.	126-134 (SF33)	129
	" 35	N.A.	N.A.	118-126 (SF34)	122
	" 36	N.A.	N.A.	112-120 (SF35)	115
	" 37	N.A.	N.A.	103-113 (SF36)	108
	" 38	N.A.	N.A.	097-107 (SF37)	101
	" 39	N.A.	N.A.	091-101 (SF38)	096
	" 40	N.A.	N.A.	087-097 (SF39)	092
	" 41	N.A.	N.A.	168-178 (SF40)	173
	" 42	N.A.	N.A.	166-172 (SF41)	169
	" 43	N.A.	N.A.	162-168 (SF42)	166
	" 44	N.A.	N.A.	159-165 (SF43)	162
	" 45	N.A.	N.A.	155-161 (SF44)	158
	" 46	N.A.	N.A.	149-157 (SF45)	153
	" 47	N.A.	N.A.	143-151 (SF46)	148
	" 48	N.A.	N.A.	140-148 (SF47)	144
	" 49	N.A.	N.A.	136-144 (SF48)	139
	" 50	N.A.	N.A.	130-138 (SF49)	134
	" 51	N.A.	N.A.	124-132 (SF50)	128
	" 52	N.A.	N.A.	118-126 (SF51)	122
	" 53	N.A.	N.A.	113-121 (SF52)	117
	" 54	N.A.	N.A.	104-114 (SF53)	109
	" 55	N.A.	N.A.	097-107 (SF54)	102
	" 56	N.A.	N.A.	090-100 (SF55)	095
	" 57	N.A.	N.A.	083-093 (SF56)	088
	" 58	N.A.	N.A.	075-087 (SF57)	081
	" 59	N.A.	N.A.	069-083 (SF58)	076
	" 60	N.A.	N.A.	066-080 (SF59)	072
	" 61	N.A.	N.A.	147-157 (SF60)	153
	" 62	N.A.	N.A.	144-154 (SF61)	149
	" 63	N.A.	N.A.	141-151 (SF62)	145
	" 64	N.A.	N.A.	137-147 (SF63)	142
	" 65	N.A.	N.A.	132-142 (SF64)	138
	" 66	N.A.	N.A.	128-138 (SF65)	133
	" 67	N.A.	N.A.	122-132 (SF66)	127
	" 68				

TABLE 1

Tested By P.H. Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4R	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	119
	" 70	N.A.	N.A.	109-119 (SF69)	113
	" 71	N.A.	N.A.	102-114 (SF70)	108
	" 72	N.A.	N.A.	096-108 (SF71)	102
	" 73	N.A.	N.A.	091-103 (SF72)	097
	" 74	N.A.	N.A.	083-095 (SF73)	089
	" 75	N.A.	N.A.	075-089 (SF74)	083
	" 76	N.A.	N.A.	067-083 (SF75)	074
	" 77	N.A.	N.A.	060-076 (SF76)	068
	" 78	N.A.	N.A.	051-071 (SF77)	062
	" 79	N.A.	N.A.	045-067 (SF78)	057
	" 80	N,A,	N.A.	041-063 (SF79)	054
	" 81	N.A.	N.A.	129-137 (SF80)	132
	" 82	N.A.	N.A.	125-133 (SF81)	129
	" 83	N.A.	N.A.	121-129 (SF82)	125
	" 84	N.A.	N.A.	118-126 (SF83)	121
	" 85	N.A.	N.A.	113-123 (SF84)	117
	" 86	N.A.	N.A.	108-118 (SF85)	113
	" 87	N.A.	N.A.	101-113 (SF86)	107
	" 88	N.A.	N.A.	097-109 (SF87)	104
	" 89	N.A.	N.A.	093-105 (SF88)	099
	" 90	N.A.	N.A.	087-099 (SF89)	093
	" 91	N.A.	N.A.	082-094 (SF90)	088
	" 92	N.A.	N.A.	075-089 (SF91)	082
	" 93	N.A.	N.A.	071-085 (SF92)	078
	" 94	N.A.	N.A.	059-077 (SF93)	070
	" 95	N.A.	N.A.	053-071 (SF94)	063
	" 96	N.A.	N.A.	043-065 (SF95)	056
	" 97	N.A.	N.A.	034-058 (SF96)	049
	" 98	N.A.	N.A.	026-056 (SF97)	044
	" 99	N.A.	N.A.	020-050 (SF98)	040
	" 100	N.A.	N.A.	014-050 (SF99)	037
	" 101	N.A.	N.A.	106-118 (SF100)	112
	" 102	N.A.	N.A.	102-114 (SF101)	107
	" 103	N.A.	N.A.	099-111 (SF102)	105

TABLE 1

Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.4.2	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	101
	" 105	N.A.	N.A.	090-114 (SF104)	097
	" 106	N.A.	N.A.	086-100 (SF105)	093
	" 107	N.A.	N.A.	080-094 (SF106)	087
	" 108	N.A.	N.A.	075-089 (SF107)	084
	" 109	N.A.	N.A.	070-086 (SF108)	079
	" 110	N.A.	N.A.	065-081 (SF109)	074
	" 111	N.A.	N.A.	059-075 (SF110)	069
	" 112	N.A.	N.A.	053-071 (SF111)	062
	" 113	N.A.	N.A.	046-066 (SF112)	059
	" 114	N.A.	N.A.	037-059 (SF113)	051
	" 115	N.A.	N.A.	027-055 (SF114)	044
	" 116	N.A.	N.A.	020-048 (SF115)	036
	" 117	N.A.	N.A.	010-044 (SF116)	030
	" 118	N.A.	N.A.	000-040 (SF117)	025
	" 119	N.A.	N.A.	000-036 (SF118)	023
	" 120	N.A.	N.A.	000-034 (SF119)	020
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	213
	" 122	N.A.	N.A.	" (SF121)	210
	" 123	N.A.	N.A.	" (SF122)	206
	" 124	N.A.	N.A.	" (SF123)	202
	" 125	N.A.	N.A.	" (SF124)	198
	" 126	N.A.	N.A.	" (SF125)	219
	" 127	N.A.	N.A.	" (SF126)	217
	" 128	N.A.	N.A.	" (SF127)	216
		+HV (SF=8)	=226		
		-HV (SF=23)	=207		
		Temp TC =	22.7°C		

TABLE 1

Tested By P.H. Bauer
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.5.1					
	Experiment +60	N.A.	N.A.	218-224 (SF16)	220
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	214
	" - 5	N.A.	N.A.	211-217 (SF20)	214
	" -30	N.A.	N.A.	192-198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244-250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229-235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	206
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	180
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245-251 (SF15)	249
	" 17	N.A.	N.A.	232-238 (SF16)	235
	" 18	N.A.	N.A.	220-226 (SF17)	223
	" 19	N.A.	N.A.	201-207 (SF18)	204
	" 20	N.A.	N.A.	186-192 (SF19)	189
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	206
	" 2	N.A.	N.A.	162-170 (SF20)	166
	" 3	N.A.	N.A.	122-132 (SF40)	125
	" 4	N.A.	N.A.	[illegible]	[illegible]

TABLE 1

Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.5.1	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	045
	" 6	N.A.	N.A.	< 030 (SF100)	007
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	213
	" 2	N.A.	N.A.	207-213 (SF 1)	209
	" 3	N.A.	N.A.	203-209 (SF 2)	205
	" 4	N.A.	N.A.	199-205 (SF 3)	202
	" 5	N.A.	N.A.	195-201 (SF 4)	198
	" 6	N.A.	N.A.	191-197 (SF 5)	193
	" 7	N.A.	N.A.	185-191 (SF 6)	187
	" 8	N.A.	N.A.	181-187 (SF 7)	184
	" 9	N.A.	N.A.	176-182 (SF 8)	179
	" 10	N.A.	N.A.	171-177 (SF 9)	173
	" 11	N.A.	N.A.	165-171 (SF10)	168
	" 12	N.A.	N.A.	160-166 (SF11)	162
	" 13	N.A.	N.A.	155-161 (SF12)	157
	" 14	N.A.	N.A.	147-153 (SF13)	149
	" 15	N.A.	N.A.	139-147 (SF14)	142
	" 16	N.A.	N.A.	132-140 (SF15)	134
	" 17	N.A.	N.A.	126-134 (SF16)	127
	" 18	N.A.	N.A.	118-126 (SF17)	121
	" 19	N.A.	N.A.	112-120 (SF18)	115
	" 20	N.A.	N.A.	108-116 (SF19)	111
	" 21	N.A.	N.A.	189-195 (SF20)	193
	" 22	N.A.	N.A.	187-193 (SF21)	189
	" 23	N.A.	N.A.	183-189 (SF22)	185
	" 24	N.A.	N.A.	179-185 (SF23)	181
	" 25	N.A.	N.A.	175-181 (SF24)	177
	" 26	N.A.	N.A.	170-176 (SF25)	173
	" 27	N.A.	N.A.	166-172 (SF26)	167
	" 28	N.A.	N.A.	161-167 (SF27)	164
	" 29	N.A.	N.A.	155-163 (SF28)	159
	" 30	N.A.	N.A.	150-158 (SF29)	153
	" 31	N.A.	N.A.	144-152 (SF30)	148
	" 32	N.A.	N.A.	138-146 (SF31)	142
	" 33				

TABLE 1

Date 23 MAY 03
Tested By P.H. BOUCET
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.5.1	VelFiltStep 34	N.A.	N.A.	126-134 (SF33)	128
	" 35	N.A.	N.A.	118-126 (SF34)	122
	" 36	N.A.	N.A.	112-120 (SF35)	114
	" 37	N.A.	N.A.	103-113 (SF36)	107
	" 38	N.A.	N.A.	097-107 (SF37)	101
	" 39	N.A.	N.A.	091-101 (SF38)	095
	" 40	N.A.	N.A.	087-097 (SF39)	092
	" 41	N.A.	N.A.	168-178 (SF40)	172
	" 42	N.A.	N.A.	166-172 (SF41)	169
	" 43	N.A.	N.A.	162-168 (SF42)	165
	" 44	N.A.	N.A.	159-165 (SF43)	161
	" 45	N.A.	N.A.	155-161 (SF44)	157
	" 46	N.A.	N.A.	149-157 (SF45)	153
	" 47	N.A.	N.A.	143-151 (SF46)	147
	" 48	N.A.	N.A.	140-148 (SF47)	143
	" 49	N.A.	N.A.	136-144 (SF48)	138
	" 50	N.A.	N.A.	130-138 (SF49)	133
	" 51	N.A.	N.A.	124-132 (SF50)	127
	" 52	N.A.	N.A.	118-126 (SF51)	121
	" 53	N.A.	N.A.	113-121 (SF52)	116
	" 54	N.A.	N.A.	104-114 (SF53)	108
	" 55	N.A.	N.A.	097-107 (SF54)	102
	" 56	N.A.	N.A.	090-100 (SF55)	094
	" 57	N.A.	N.A.	083-093 (SF56)	088
	" 58	N.A.	N.A.	075-087 (SF57)	081
	" 59	N.A.	N.A.	069-083 (SF58)	076
	" 60	N.A.	N.A.	066-080 (SF59)	072
	" 61	N.A.	N.A.	147-157 (SF60)	152
	" 62	N.A.	N.A.	144-154 (SF61)	148
	" 63	N.A.	N.A.	141-151 (SF62)	145
	" 64	N.A.	N.A.	137-147 (SF63)	141
	" 65	N.A.	N.A.	132-142 (SF64)	137
	" 66	N.A.	N.A.	128-138 (SF65)	133
	" 67	N.A.	N.A.	122-132 (SF66)	127
	" 68				

TABLE 1

Tested By C.H. Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.5.1	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	118
	" 70	N.A.	N.A.	109-119 (SF69)	113
	" 71	N.A.	N.A.	102-114 (SF70)	107
	" 72	N.A.	N.A.	096-108 (SF71)	101
	" 73	N.A.	N.A.	091-103 (SF72)	096
	" 74	N.A.	N.A.	083-095 (SF73)	088
	" 75	N.A.	N.A.	075-089 (SF74)	082
	" 76	N.A.	N.A.	067-083 (SF75)	074
	" 77	N.A.	N.A.	060-076 (SF76)	068
	" 78	N.A.	N.A.	051-071 (SF77)	061
	" 79	N.A.	N.A.	045-067 (SF78)	057
	" 80	N,A,	N.A.	041-063 (SF79)	053
	" 81	N.A.	N.A.	129-137 (SF80)	132
	" 82	N.A.	N.A.	125-133 (SF81)	125
	" 83	N.A.	N.A.	121-129 (SF82)	124
	" 84	N.A.	N.A.	118-126 (SF83)	121
	" 85	N.A.	N.A.	113-123 (SF84)	117
	" 86	N.A.	N.A.	108-118 (SF85)	113
	" 87	N.A.	N.A.	101-113 (SF86)	106
	" 88	N.A.	N.A.	097-109 (SF87)	103
	" 89	N.A.	N.A.	093-105 (SF88)	098
	" 90	N.A.	N.A.	087-099 (SF89)	093
	" 91	N.A.	N.A.	082-094 (SF90)	088
	" 92	N.A.	N.A.	075-089 (SF91)	082
	" 93	N.A.	N.A.	071-085 (SF92)	077
	" 94	N.A.	N.A.	059-077 (SF93)	069
	" 95	N.A.	N.A.	053-071 (SF94)	063
	" 96	N.A.	N.A.	043-065 (SF95)	055
	" 97	N.A.	N.A.	034-058 (SF96)	049
	" 98	N.A.	N.A.	026-056 (SF97)	042
	" 99	N.A.	N.A.	020-050 (SF98)	038
	" 100	N.A.	N.A.	014-050 (SF99)	035
	" 101	N.A.	N.A.	106-118 (SF100)	112
	" 102	N.A.	N.A.	102-114 (SF101)	108
	" 103	N.A.	N.A.	099-111 (SF102)	105

TABLE 1

Tested By W. Bauer
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings Predicted	Analog Readings Actual	Digital Readings Predicted	Digital Readings Actual
H.51	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	101
	" 105	N.A.	N.A.	090-114 (SF104)	097
	" 106	N.A.	N.A.	086-100 (SF105)	093
	" 107	N.A.	N.A.	080-094 (SF106)	087
	" 108	N.A.	N.A.	075-089 (SF107)	083
	" 109	N.A.	N.A.	070-086 (SF108)	079
	" 110	N.A.	N.A.	065-081 (SF109)	073
	" 111	N.A.	N.A.	059-075 (SF110)	068
	" 112	N.A.	N.A.	053-071 (SF111)	062
	" 113	N.A.	N.A.	046-066 (SF112)	058
	" 114	N.A.	N.A.	037-059 (SF113)	050
	" 115	N.A.	N.A.	027-055 (SF114)	044
	" 116	N.A.	N.A.	020-048 (SF115)	036
	" 117	N.A.	N.A.	010-044 (SF116)	032
	" 118	N.A.	N.A.	000-040 (SF117)	026
	" 119	N.A.	N.A.	000-036 (SF118)	022
	" 120	N.A.	N.A.	000-034 (SF119)	019
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	213
	" 122	N.A.	N.A.	" (SF121)	209
	" 123	N.A.	N.A.	" (SF122)	206
	" 124	N.A.	N.A.	" (SF123)	202
	" 125	N.A.	N.A.	" (SF124)	198
	" 126	N.A.	N.A.	" (SF125)	219
	" 127	N.A.	N.A.	" (SF126)	216
	" 128	N.A.	N.A.	" (SF127)	215
				TC ≈ 13°C	
		+HV (SE5)	= 226	TEMP 1 (137)	= 235°K
		-HV (SE55)	= 207	2 (109)	= 11°C
		+OFF, -ON	156	3 (119)	= 5°C
		+ON, -OFF	050	4 (110)	= 12°C
				5 (109)	= 12.5°C
				6 (116)	= 10°C

TABLE 1

Tested By PH Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.6.1	Experiment +60	N.A.	N.A.	218-224 (SF16)	220
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	215
	" - 5	N.A.	N.A.	211-217 (SF20)	214
	" -30	N.A.	N.A.	192-198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244-250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229-235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	206
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	180
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245-251 (SF15)	249
	" 17	N.A.	N.A.	232-238 (SF16)	235
	" 18	N.A.	N.A.	220-226 (SF17)	223
	" 19	N.A.	N.A.	201-207 (SF18)	204
	" 20	N.A.	N.A.	186-192 (SF19)	189
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	205
	" 2	N.A.	N.A.	162-170 (SF20)	165
	" 3	N.A.	N.A.	122-132 (SF40)	124
	" 4	N.A.	N.A.	077-095 (SF60)	084

TABLE 1

Tested By P.H. Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.6.1	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	048
	" 6	N.A.	N.A.	< 030 (SF100)	005
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	212
	" 2	N.A.	N.A.	207-213 (SF 1)	208
	" 3	N.A.	N.A.	203-209 (SF 2)	205
	" 4	N.A.	N.A.	199-205 (SF 3)	201
	" 5	N.A.	N.A.	195-201 (SF 4)	197
	" 6	N.A.	N.A.	191-197 (SF 5)	192
	" 7	N.A.	N.A.	185-191 (SF 6)	186
	" 8	N.A.	N.A.	181-187 (SF 7)	183
	" 9	N.A.	N.A.	176-182 (SF 8)	178
	" 10	N.A.	N.A.	171-177 (SF 9)	172
	" 11	N.A.	N.A.	165-171 (SF10)	167
	" 12	N.A.	N.A.	160-166 (SF11)	161
	" 13	N.A.	N.A.	155-161 (SF12)	156
	" 14	N.A.	N.A.	147-153 (SF13)	148
	" 15	N.A.	N.A.	139-147 (SF14)	141
	" 16	N.A.	N.A.	132-140 (SF15)	133
	" 17	N.A.	N.A.	126-134 (SF16)	126
	" 18	N.A.	N.A.	118-126 (SF17)	120
	" 19	N.A.	N.A.	112-120 (SF18)	114
	" 20	N.A.	N.A.	108-116 (SF19)	111
	" 21	N.A.	N.A.	189-195 (SF20)	192
	" 22	N.A.	N.A.	187-193 (SF21)	188
	" 23	N.A.	N.A.	183-189 (SF22)	184
	" 24	N.A.	N.A.	179-185 (SF23)	180
	" 25	N.A.	N.A.	175-181 (SF24)	176
	" 26	N.A.	N.A.	170-176 (SF25)	172
	" 27	N.A.	N.A.	166-172 (SF26)	166
	" 28	N.A.	N.A.	161-167 (SF27)	163
	" 29	N.A.	N.A.	155-163 (SF28)	158
	" 30	N.A.	N.A.	150-158 (SF29)	152
	" 31	N.A.	N.A.	144-152 (SF30)	147
	" 32	N.A.	N.A.	138-146 (SF31)	141
	" 33				

Date 2 Nov 83
Tested By R.H. Bailey
Quality Assurance
Govt. Representative

TABLE I.

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.6.1	VelFiltStep 34	N.A.	N.A.	126-134 (SF33)	127
	" 35	N.A.	N.A.	118-126 (SF34)	121
	" 36	N.A.	N.A.	112-120 (SF35)	113
	" 37	N.A.	N.A.	103-113 (SF36)	106
	" 38	N.A.	N.A.	097-107 (SF37)	099
	" 39	N.A.	N.A.	091-101 (SF38)	094
	" 40	N.A.	N.A.	087-097 (SF39)	090
	" 41	N.A.	N.A.	168-178 (SF40)	171
	" 42	N.A.	N.A.	166-172 (SF41)	168
	" 43	N.A.	N.A.	162-168 (SF42)	164
	" 44	N.A.	N.A.	159-165 (SF43)	160
	" 45	N.A.	N.A.	155-161 (SF44)	156
	" 46	N.A.	N.A.	149-157 (SF45)	152
	" 47	N.A.	N.A.	143-151 (SF46)	146
	" 48	N.A.	N.A.	140-148 (SF47)	143
	" 49	N.A.	N.A.	136-144 (SF48)	138
	" 50	N.A.	N.A.	130-138 (SF49)	132
	" 51	N.A.	N.A.	124-132 (SF50)	126
	" 52	N.A.	N.A.	118-126 (SF51)	120
	" 53	N.A.	N.A.	113-121 (SF52)	115
	" 54	N.A.	N.A.	104-114 (SF53)	107
	" 55	N.A.	N.A.	097-107 (SF54)	101
	" 56	N.A.	N.A.	090-100 (SF55)	093
	" 57	N.A.	N.A.	083-093 (SF56)	087
	" 58	N.A.	N.A.	075-087 (SF57)	080
	" 59	N.A.	N.A.	069-083 (SF58)	075
	" 60	N.A.	N.A.	066-080 (SF59)	071
	" 61	N.A.	N.A.	147-157 (SF60)	151
	" 62	N.A.	N.A.	144-154 (SF61)	147
	" 63	N.A.	N.A.	141-151 (SF62)	144
	" 64	N.A.	N.A.	137-147 (SF63)	140
	" 65	N.A.	N.A.	132-142 (SF64)	136
	" 66	N.A.	N.A.	128-138 (SF65)	132
	" 67	N.A.	N.A.	122-132 (SF66)	126
	" 68				

TABLE 1

Tested By P.H. Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.6.1	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	117
	" 70	N.A.	N.A.	109-119 (SF69)	112
	" 71	N.A.	N.A.	102-114 (SF70)	106
	" 72	N.A.	N.A.	096-108 (SF71)	100
	" 73	N.A.	N.A.	091-103 (SF72)	095
	" 74	N.A.	N.A.	083-095 (SF73)	088
	" 75	N.A.	N.A.	075-089 (SF74)	081
	" 76	N.A.	N.A.	067-083 (SF75)	073
	" 77	N.A.	N.A.	060-076 (SF76)	067
	" 78	N.A.	N.A.	051-071 (SF77)	061
	" 79	N.A.	N.A.	045-067 (SF78)	056
	" 80	N,A,	N.A.	041-063 (SF79)	053
	" 81	N.A.	N.A.	129-137 (SF80)	131
	" 82	N.A.	N.A.	125-133 (SF81)	127
	" 83	N.A.	N.A.	121-129 (SF82)	124
	" 84	N.A.	N.A.	118-126 (SF83)	120
	" 85	N.A.	N.A.	113-123 (SF84)	116
	" 86	N.A.	N.A.	108-118 (SF85)	112
	" 87	N.A.	N.A.	101-113 (SF86)	105
	" 88	N.A.	N.A.	097-109 (SF87)	102
	" 89	N.A.	N.A.	093-105 (SF88)	097
	" 90	N.A.	N.A.	087-099 (SF89)	092
	" 91	N.A.	N.A.	082-094 (SF90)	087
	" 92	N.A.	N.A.	075-089 (SF91)	080
	" 93	N.A.	N.A.	071-085 (SF92)	076
	" 94	N.A.	N.A.	059-077 (SF93)	068
	" 95	N.A.	N.A.	053-071 (SF94)	062
	" 96	N.A.	N.A.	043-065 (SF95)	054
	" 97	N.A.	N.A.	034-058 (SF96)	049
	" 98	N.A.	N.A.	026-056 (SF97)	043
	" 99	N.A.	N.A.	020-050 (SF98)	035
	" 100	N.A.	N.A.	014-050 (SF99)	034
	" 101	N.A.	N.A.	106-118 (SF100)	111
	" 102	N.A.	N.A.	102-114 (SF101)	107
	" 103	N.A.	N.A.	099-111 (SF102)	104

TABLE 1

Tested By R.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings Predicted	Analog Readings Actual	Digital Readings Predicted	Digital Readings Actual
4.6.1	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	100
	" 105	N.A.	N.A.	090-114 (SF104)	096
	" 106	N.A.	N.A.	086-100 (SF105)	092
	" 107	N.A.	N.A.	080-094 (SF106)	085
	" 108	N.A.	N.A.	075-089 (SF107)	082
	" 109	N.A.	N.A.	070-086 (SF108)	077
	" 110	N.A.	N.A.	065-081 (SF109)	072
	" 111	N.A.	N.A.	059-075 (SF110)	067
	" 112	N.A.	N.A.	053-071 (SF111)	061
	" 113	N.A.	N.A.	046-066 (SF112)	057
	" 114	N.A.	N.A.	037-059 (SF113)	049
	" 115	N.A.	N.A.	027-055 (SF114)	043
	" 116	N.A.	N.A.	020-048 (SF115)	036
	" 117	N.A.	N.A.	010-044 (SF116)	030
	" 118	N.A.	N.A.	000-040 (SF117)	025
	" 119	N.A.	N.A.	000-036 (SF118)	020
	" 120	N.A.	N.A.	000-034 (SF119)	020
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	212
	" 122	N.A.	N.A.	" (SF121)	208
	" 123	N.A.	N.A.	" (SF122)	205
	" 124	N.A.	N.A.	" (SF123)	201
	" 125	N.A.	N.A.	" (SF124)	197
	" 126	N.A.	N.A.	" (SF125)	218
	" 127	N.A.	N.A.	" (SF126)	216
	" 128	N.A.	N.A.	" (SF127)	214
				TC =	
		+HV (SF5)	226	TEMP 1 (130)	
		-HV (SF23)	207	2 (132)	
		+HV cal - HV ref	000 (SF55)	3 (152)	
		-HV cal + HV ref	= 006 (SF40)	4 (133)	
				5 (130)	
				6 (146)	

TABLE 1

Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.7.1					
	Experiment +60	N.A.	N.A.	218-224 (SF16)	221
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	215
	" - 5	N.A.	N.A.	211-217 (SF20)	214
	" -30	N.A.	N.A.	192-198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244-250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229-235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	206
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	180
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245-251 (SF15)	249
	" 17	N.A.	N.A.	232-238 (SF16)	235
	" 18	N.A.	N.A.	220-226 (SF17)	223
	" 19	N.A.	N.A.	201-207 (SF18)	204
	" 20	N.A.	N.A.	186-192 (SF19)	187
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	205
	" 2	N.A.	N.A.	162-170 (SF20)	164
	" 3	N.A.	N.A.	122-132 (SF40)	123
	" 4	N.A.	N.A.		

TABLE 1

Tested By P.H. Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.7.1	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	043
	" 6	N.A.	N.A.	< 030 (SF100)	006
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	211
	" 2	N.A.	N.A.	207-213 (SF 1)	208
	" 3	N.A.	N.A.	203-209 (SF 2)	204
	" 4	N.A.	N.A.	199-205 (SF 3)	200
	" 5	N.A.	N.A.	195-201 (SF 4)	196
	" 6	N.A.	N.A.	191-197 (SF 5)	192
	" 7	N.A.	N.A.	185-191 (SF 6)	186
	" 8	N.A.	N.A.	181-187 (SF 7)	182
	" 9	N.A.	N.A.	176-182 (SF 8)	177
	" 10	N.A.	N.A.	171-177 (SF 9)	172
	" 11	N.A.	N.A.	165-171 (SF10)	166
	" 12	N.A.	N.A.	160-166 (SF11)	160
	" 13	N.A.	N.A.	155-161 (SF12)	155
	" 14	N.A.	N.A.	147-153 (SF13)	147
	" 15	N.A.	N.A.	139-147 (SF14)	140
	" 16	N.A.	N.A.	132-140 (SF15)	133
	" 17	N.A.	N.A.	126-134 (SF16)	121
	" 18	N.A.	N.A.	118-126 (SF17)	119
	" 19	N.A.	N.A.	112-120 (SF18)	113
	" 20	N.A.	N.A.	108-116 (SF19)	110
	" 21	N.A.	N.A.	189-195 (SF20)	191
	" 22	N.A.	N.A.	187-193 (SF21)	187
	" 23	N.A.	N.A.	183-189 (SF22)	184
	" 24	N.A.	N.A.	179-185 (SF23)	180
	" 25	N.A.	N.A.	175-181 (SF24)	176
	" 26	N.A.	N.A.	170-176 (SF25)	171
	" 27	N.A.	N.A.	166-172 (SF26)	165 X
	" 28	N.A.	N.A.	161-167 (SF27)	162
	" 29	N.A.	N.A.	155-163 (SF28)	157
	" 30	N.A.	N.A.	150-158 (SF29)	151
	" 31	N.A.	N.A.	144-152 (SF30)	146
	" 32	N.A.	N.A.	138-144 (SF31)	140
	" 33				

Date 4/30/69
Tested By P.H. Bailey
Quality Assurance
Govt. Representative

TABLE 1

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.7.1	VelFiltStep 34	N.A.	N.A.	126-134 (SF33)	127
	" 35	N.A.	N.A.	118-126 (SF34)	120
	" 36	N.A.	N.A.	112-120 (SF35)	112
	" 37	N.A.	N.A.	103-113 (SF36)	105
	" 38	N.A.	N.A.	097-107 (SF37)	099
	" 39	N.A.	N.A.	091-101 (SF38)	093
	" 40	N.A.	N.A.	087-097 (SF39)	089
	" 41	N.A.	N.A.	168-178 (SF40)	170
	" 42	N.A.	N.A.	166-172 (SF41)	167
	" 43	N.A.	N.A.	162-168 (SF42)	163
	" 44	N.A.	N.A.	159-165 (SF43)	157
	" 45	N.A.	N.A.	155-161 (SF44)	155
	" 46	N.A.	N.A.	149-157 (SF45)	151
	" 47	N.A.	N.A.	143-151 (SF46)	145
	" 48	N.A.	N.A.	140-148 (SF47)	142
	" 49	N.A.	N.A.	136-144 (SF48)	136
	" 50	N.A.	N.A.	130-138 (SF49)	131
	" 51	N.A.	N.A.	124-132 (SF50)	125
	" 52	N.A.	N.A.	118-126 (SF51)	119
	" 53	N.A.	N.A.	113-121 (SF52)	114
	" 54	N.A.	N.A.	104-114 (SF53)	107
	" 55	N.A.	N.A.	097-107 (SF54)	099
	" 56	N.A.	N.A.	090-100 (SF55)	092
	" 57	N.A.	N.A.	083-093 (SF56)	086
	" 58	N.A.	N.A.	075-087 (SF57)	079
	" 59	N.A.	N.A.	069-083 (SF58)	073
	" 60	N.A.	N.A.	066-080 (SF59)	070
	" 61	N.A.	N.A.	147-157 (SF60)	150
	" 62	N.A.	N.A.	144-154 (SF61)	146
	" 63	N.A.	N.A.	141-151 (SF62)	142
	" 64	N.A.	N.A.	137-147 (SF63)	139
	" 65	N.A.	N.A.	132-142 (SF64)	135
	" 66	N.A.	N.A.	128-138 (SF65)	130
	" 67	N.A.	N.A.	122-132 (SF66)	124
	" 68				

TABLE 1

Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.7.1	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	117
	" 70	N.A.	N.A.	109-119 (SF69)	112
	" 71	N.A.	N.A.	102-114 (SF70)	106
	" 72	N.A.	N.A.	096-108 (SF71)	100
	" 73	N.A.	N.A.	091-103 (SF72)	095
	" 74	N.A.	N.A.	083-095 (SF73)	087
	" 75	N.A.	N.A.	075-089 (SF74)	081
	" 76	N.A.	N.A.	067-083 (SF75)	073
	" 77	N.A.	N.A.	060-076 (SF76)	067
	" 78	N.A.	N.A.	051-071 (SF77)	061
	" 79	N.A.	N.A.	045-067 (SF78)	056
	" 80	N,A,	N.A.	041-063 (SF79)	052
	" 81	N.A.	N.A.	129-137 (SF80)	130
	" 82	N.A.	N.A.	125-133 (SF81)	127
	" 83	N.A.	N.A.	121-129 (SF82)	123
	" 84	N.A.	N.A.	118-126 (SF83)	119
	" 85	N.A.	N.A.	113-123 (SF84)	115
	" 86	N.A.	N.A.	108-118 (SF85)	111
	" 87	N.A.	N.A.	101-113 (SF86)	105
	" 88	N.A.	N.A.	097-109 (SF87)	102
	" 89	N.A.	N.A.	093-105 (SF88)	097
	" 90	N.A.	N.A.	087-099 (SF89)	092
	" 91	N.A.	N.A.	082-094 (SF90)	086
	" 92	N.A.	N.A.	075-089 (SF91)	081
	" 93	N.A.	N.A.	071-085 (SF92)	075
	" 94	N.A.	N.A.	059-077 (SF93)	065
	" 95	N.A.	N.A.	053-071 (SF94)	062
	" 96	N.A.	N.A.	043-065 (SF95)	054
	" 97	N.A.	N.A.	034-058 (SF96)	049
	" 98	N.A.	N.A.	026-056 (SF97)	041
	" 99	N.A.	N.A.	020-050 (SF98)	035
	" 100	N.A.	N.A.	014-050 (SF99)	034
	" 101	N.A.	N.A.	106-118 (SF100)	110
	" 102	N.A.	N.A.	102-114 (SF101)	107
	" 103	N.A.	N.A.	099-111 (SF102)	103

TABLE 1

Tested By P.H. BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.7.1	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	099
	" 105	N.A.	N.A.	090-114 (SF104)	096
	" 106	N.A.	N.A.	086-100 (SF105)	091
	" 107	N.A.	N.A.	080-094 (SF106)	085
	" 108	N.A.	N.A.	075-089 (SF107)	080
	" 109	N.A.	N.A.	070-086 (SF108)	077
	" 110	N.A.	N.A.	065-081 (SF109)	072
	" 111	N.A.	N.A.	059-075 (SF110)	067
	" 112	N.A.	N.A.	053-071 (SF111)	061
	" 113	N.A.	N.A.	046-066 (SF112)	057
	" 114	N.A.	N.A.	037-059 (SF113)	048
	" 115	N.A.	N.A.	027-055 (SF114)	044
	" 116	N.A.	N.A.	020-048 (SF115)	034
	" 117	N.A.	N.A.	010-044 (SF116)	029
	" 118	N.A.	N.A.	000-040 (SF117)	024
	" 119	N.A.	N.A.	000-036 (SF118)	022
	" 120	N.A.	N.A.	000-034 (SF119)	018
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	211
	" 122	N.A.	N.A.	" (SF121)	208
	" 123	N.A.	N.A.	" (SF122)	204
	" 124	N.A.	N.A.	" (SF123)	200
	" 125	N.A.	N.A.	" (SF124)	196
	" 126	N.A.	N.A.	" (SF125)	218
	" 127	N.A.	N.A.	" (SF126)	215
	" 128	N.A.	N.A.	" (SF127)	214
		+HV (SF8)	226	TEMP1 (125)	
		-HV (SF23)	207	2 (147)	
		-HV ON +HV OFF SF 4/0	058	3 (170)	
				4 (151)	
				5 (146)	
				6 (166)	

TABLE 1

Tested By R.H. Bauer
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.8.1					
	Experiment +60	N.A.	N.A.	218-224 (SF16)	221
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	215
	" - 5	N.A.	N.A.	211-217 (SF20)	214
	" -30	N.A.	N.A.	192-198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244-250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229-235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	205
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	180
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245-251 (SF15)	249
	" 17	N.A.	N.A.	232-238 (SF16)	235
	" 18	N.A.	N.A.	220-226 (SF17)	223
	" 19	N.A.	N.A.	201-207 (SF18)	204
	" 20	N.A.	N.A.	186-192 (SF19)	189
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	205
	" 2	N.A.	N.A.	162-170 (SF20)	164
	" 3	N.A.	N.A.	122-132 (SF40)	123
	" 4	N.A.	N.A.	[illegible]	[illegible]

TABLE 1

Tested By RH Bauer
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.8.1	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	044
	" 6	N.A.	N.A.	< 030 (SF100)	007
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	211
	" 2	N.A.	N.A.	207-213 (SF 1)	208
	" 3	N.A.	N.A.	203-209 (SF 2)	204
	" 4	N.A.	N.A.	199-205 (SF 3)	200
	" 5	N.A.	N.A.	195-201 (SF 4)	196
	" 6	N.A.	N.A.	191-197 (SF 5)	192
	" 7	N.A.	N.A.	185-191 (SF 6)	186
	" 8	N.A.	N.A.	181-187 (SF 7)	182
	" 9	N.A.	N.A.	176-182 (SF 8)	177
	" 10	N.A.	N.A.	171-177 (SF 9)	172
	" 11	N.A.	N.A.	165-171 (SF10)	166
	" 12	N.A.	N.A.	160-166 (SF11)	160
	" 13	N.A.	N.A.	155-161 (SF12)	155
	" 14	N.A.	N.A.	147-153 (SF13)	147
	" 15	N.A.	N.A.	139-147 (SF14)	140
	" 16	N.A.	N.A.	132-140 (SF15)	133
	" 17	N.A.	N.A.	126-134 (SF16)	126
	" 18	N.A.	N.A.	118-126 (SF17)	119
	" 19	N.A.	N.A.	112-120 (SF18)	114
	" 20	N.A.	N.A.	108-116 (SF19)	110
	" 21	N.A.	N.A.	189-195 (SF20)	191
	" 22	N.A.	N.A.	187-193 (SF21)	187
	" 23	N.A.	N.A.	183-189 (SF22)	184
	" 24	N.A.	N.A.	179-185 (SF23)	180
	" 25	N.A.	N.A.	175-181 (SF24)	176
	" 26	N.A.	N.A.	170-176 (SF25)	171
	" 27	N.A.	N.A.	166-172 (SF26)	165 X
	" 28	N.A.	N.A.	161-167 (SF27)	162
	" 29	N.A.	N.A.	155-163 (SF28)	157
	" 30	N.A.	N.A.	150-158 (SF29)	151
	" 31	N.A.	N.A.	144-152 (SF30)	146
	" 32	N.A.	N.A.	138-146 (SF31)	140
	" 33	N.A.	N.A.	134-142 (SF32)	135

TABLE I

Tested By
Quality Assurance
Govt. Representative P H Bailey

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.8.1	VelFiltStep 34	N.A.	N.A.	126--134 (SF33)	127
	" 35	N.A.	N.A.	118--126 (SF34)	120
	" 36	N.A.	N.A.	112--120 (SF35)	112
	" 37	N.A.	N.A.	103--113 (SF36)	106
	" 38	N.A.	N.A.	097--107 (SF37)	099
	" 39	N.A.	N.A.	091--101 (SF38)	093
	" 40	N.A.	N.A.	087--097 (SF39)	090
	" 41	N.A.	N.A.	168--178 (SF40)	171
	" 42	N.A.	N.A.	166--172 (SF41)	167
	" 43	N.A.	N.A.	162--168 (SF42)	163
	" 44	N.A.	N.A.	159--165 (SF43)	160
	" 45	N.A.	N.A.	155--161 (SF44)	155
	" 46	N.A.	N.A.	149--157 (SF45)	151
	" 47	N.A.	N.A.	143--151 (SF46)	145
	" 48	N.A.	N.A.	140--148 (SF47)	142
	" 49	N.A.	N.A.	136--144 (SF48)	137
	" 50	N.A.	N.A.	130--138 (SF49)	131
	" 51	N.A.	N.A.	124--132 (SF50)	126
	" 52	N.A.	N.A.	118--126 (SF51)	120
	" 53	N.A.	N.A.	113--121 (SF52)	115
	" 54	N.A.	N.A.	104--114 (SF53)	106
	" 55	N.A.	N.A.	097--107 (SF54)	100
	" 56	N.A.	N.A.	090--100 (SF55)	092
	" 57	N.A.	N.A.	083--093 (SF56)	086
	" 58	N.A.	N.A.	075--087 (SF57)	079
	" 59	N.A.	N.A.	069--083 (SF58)	073
	" 60	N.A.	N.A.	066--080 (SF59)	070
	" 61	N.A.	N.A.	147--157 (SF60)	150
	" 62	N.A.	N.A.	144--154 (SF61)	147
	" 63	N.A.	N.A.	141--151 (SF62)	143
	" 64	N.A.	N.A.	137--147 (SF63)	139
	" 65	N.A.	N.A.	132--142 (SF64)	135
	" 66	N.A.	N.A.	128--138 (SF65)	131
	" 67	N.A.	N.A.	122--132 (SF66)	125
	" 68				

TABLE I

Tested By P.H. Bauer
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.8.1	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	117
	" 70	N.A.	N.A.	109-119 (SF69)	111
	" 71	N.A.	N.A.	102-114 (SF70)	106
	" 72	N.A.	N.A.	096-108 (SF71)	100
	" 73	N.A.	N.A.	091-103 (SF72)	095
	" 74	N.A.	N.A.	083-095 (SF73)	087
	" 75	N.A.	N.A.	075-089 (SF74)	080
	" 76	N.A.	N.A.	067-083 (SF75)	073
	" 77	N.A.	N.A.	060-076 (SF76)	066
	" 78	N.A.	N.A.	051-071 (SF77)	060
	" 79	N.A.	N.A.	045-067 (SF78)	056
	" 80	N,A,	N.A.	041-063 (SF79)	052
	" 81	N.A.	N.A.	129-137 (SF80)	130
	" 82	N.A.	N.A.	125-133 (SF81)	126
	" 83	N.A.	N.A.	121-129 (SF82)	123
	" 84	N.A.	N.A.	118-126 (SF83)	119
	" 85	N.A.	N.A.	113-123 (SF84)	115
	" 86	N.A.	N.A.	108-118 (SF85)	111
	" 87	N.A.	N.A.	101-113 (SF86)	105
	" 88	N.A.	N.A.	097-109 (SF87)	102
	" 89	N.A.	N.A.	093-105 (SF88)	097
	" 90	N.A.	N.A.	087-099 (SF89)	091
	" 91	N.A.	N.A.	082-094 (SF90)	086
	" 92	N.A.	N.A.	075-089 (SF91)	080
	" 93	N.A.	N.A.	071-085 (SF92)	075
	" 94	N.A.	N.A.	059-077 (SF93)	067
	" 95	N.A.	N.A.	053-071 (SF94)	061
	" 96	N.A.	N.A.	043-065 (SF95)	053
	" 97	N.A.	N.A.	034-058 (SF96)	045
	" 98	N.A.	N.A.	026-056 (SF97)	041
	" 99	N.A.	N.A.	020-050 (SF98)	038
	" 100	N.A.	N.A.	014-050 (SF99)	033
	" 101	N.A.	N.A.	106-118 (SF100)	[illegible]
	" 102	N.A.	N.A.	102-114 (SF101)	107
	" 103	N.A.	N.A.	099-111 (SF102)	103

TABLE 1

Tested By PH BAILEY
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings Predicted	Analog Readings Actual	Digital Readings Predicted	Digital Readings Actual
4.8.1	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	099
	" 105	N.A.	N.A.	090-114 (SF104)	095
	" 106	N.A.	N.A.	086-100 (SF105)	091
	" 107	N.A.	N.A.	080--094 (SF106)	085
	" 108	N.A.	N.A.	075-089 (SF107)	082
	" 109	N.A.	N.A.	070-086 (SF108)	077
	" 110	N.A.	N.A.	065--081 (SF109)	072
	" 111	N.A.	N.A.	059-075 (SF110)	066
	" 112	N.A.	N.A.	053--071 (SF111)	060
	" 113	N.A.	N.A.	046--066 (SF112)	056
	" 114	N.A.	N.A.	037-059 (SF113)	048
	" 115	N.A.	N.A.	027-055 (SF114)	043
	" 116	N.A.	N.A.	020-048 (SF115)	039
	" 117	N.A.	N.A.	010-044 (SF116)	034
	" 118	N.A.	N.A.	000-040 (SF117)	026
	" 119	N.A.	N.A.	000--036 (SF118)	019
	" 120	N.A.	N.A.	000--034 (SF119)	016
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	211
	" 122	N.A.	N.A.	" (SF121)	208
	" 123	N.A.	N.A.	" (SF122)	204
	" 124	N.A.	N.A.	" (SF123)	200
	" 125	N.A.	N.A.	" (SF124)	196
	" 126	N.A.	N.A.	" (SF125)	218
	" 127	N.A.	N.A.	" (SF126)	215
	" 128	N.A.	N.A.	" (SF127)	213
		+HV (SF8)	226	SE-HP 1 (121)	
		-HV (SF23)	207	2 (170)	
		+HV on -HV det (SF14)	036	3 (192)	
				4 (174)	
				5 (170)	
				6 (191)	

TABLE 1

Tested By PH BARRETT
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
4.8.1					
	Experiment +60	N.A.	N.A.	218-224 (SF16)	221
	" +30	N.A.	N.A.	192-198 (SF17)	195
	" +12	N.A.	N.A.	244-248 (SF28)	247
	" + 5	N.A.	N.A.	211-217 (SF 0)	215
	" - 5	N.A.	N.A.	211-217 (SF20)	214
	" -30	N.A.	N.A.	192-198 (SF21)	195
	" -12	N.A.	N.A.	244-248 (SF39)	247
	GPS Cycle 1	N.A.	N.A.	0000 (SF 0)	0000
	" 2	N.A.	N.A.	0001 (SF 0)	0001
	HECPA Step 1	N.A.	N.A.	< 080 (SF 0)	000
	" 2	N.A.	N.A.	249-255 (SF 1)	253
	" 3	N.A.	N.A.	247-253 (SF 2)	250
	" 4	N.A.	N.A.	244-250 (SF 3)	247
	" 5	N.A.	N.A.	241-247 (SF 4)	244
	" 6	N.A.	N.A.	237-243 (SF 5)	240
	" 7	N.A.	N.A.	233-239 (SF 6)	236
	" 8	N.A.	N.A.	229-235 (SF 7)	232
	" 9	N.A.	N.A.	224-230 (SF 8)	227
	" 10	N.A.	N.A.	218-224 (SF 9)	221
	" 11	N.A.	N.A.	211-217 (SF10)	214
	" 12	N.A.	N.A.	203-209 (SF11)	205
	" 13	N.A.	N.A.	192-198 (SF12)	195
	" 14	N.A.	N.A.	178-184 (SF13)	180
	" 15	N.A.	N.A.	152-158 (SF14)	155
	" 16	N.A.	N.A.	245-251 (SF15)	249
	" 17	N.A.	N.A.	232-238 (SF16)	235
	" 18	N.A.	N.A.	220-226 (SF17)	223
	" 19	N.A.	N.A.	201-207 (SF18)	204
	" 20	N.A.	N.A.	186-192 (SF19)	189
	" 21	N.A.	N.A.	161-167 (SF20)	163
	LECPA Step 1	N.A.	N.A.	204-210 (SF 0)	180 X
	" 2	N.A.	N.A.	162-170 (SF20)	140 X
	" 3	N.A.	N.A.	122-132 (SF40)	078 X
	" 4	N.A.	N.A.		

TABLE 1

Tested By P.H.Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
	LECPA Step 5	N.A.	N.A.	033-059 (SF80)	017 x
	" 6	N.A.	N.A.	< 030 (SF100)	000
	VelFiltStep 1	N.A.	N.A.	211-217 (SF 0)	187 x
	" 2	N.A.	N.A.	207-213 (SF 1)	187 x
	" 3	N.A.	N.A.	203-209 (SF 2)	178 x
	" 4	N.A.	N.A.	199-205 (SF 3)	174 x
	" 5	N.A.	N.A.	195-201 (SF 4)	163 x
	" 6	N.A.	N.A.	191-197 (SF 5)	171 x
	" 7	N.A.	N.A.	185-191 (SF 6)	170 x
	" 8	N.A.	N.A.	181-187 (SF 7)	160 x
	" 9	N.A.	N.A.	176-182 (SF 8)	149 x
	" 10	N.A.	N.A.	171-177 (SF 9)	156 x
	" 11	N.A.	N.A.	165-171 (SF10)	143 x
	" 12	N.A.	N.A.	160-166 (SF11)	135 x
	" 13	N.A.	N.A.	155-161 (SF12)	131 x
	" 14	N.A.	N.A.	147-153 (SF13)	123 x
	" 15	N.A.	N.A.	139-147 (SF14)	112 x
	" 16	N.A.	N.A.	132-140 (SF15)	109 x
	" 17	N.A.	N.A.	126-134 (SF16)	094 x
	" 18	N.A.	N.A.	118-126 (SF17)	092 x
	" 19	N.A.	N.A.	112-120 (SF18)	081 x
	" 20	N.A.	N.A.	108-116 (SF19)	078 x
	" 21	N.A.	N.A.	189-195 (SF20)	167 x
	" 22	N.A.	N.A.	187-193 (SF21)	167 x
	" 23	N.A.	N.A.	183-189 (SF22)	158 x
	" 24	N.A.	N.A.	179-185 (SF23)	154 x
	" 25	N.A.	N.A.	175-181 (SF24)	143 x
	" 26	N.A.	N.A.	170-176 (SF25)	151 x
	" 27	N.A.	N.A.	166-172 (SF26)	150 x
	" 28	N.A.	N.A.	161-167 (SF27)	139 x
	" 29	N.A.	N.A.	155-163 (SF28)	129 x
	" 30	N.A.	N.A.	150-158 (SF29)	135 x
	" 31	N.A.	N.A.	144-152 (SF30)	123 x
	" 32	N.A.	N.A.	138-146 (SF31)	115 x
	" 33				

TABLE 1

Tested By
Quality Assurance
Govt. Representative R.H. Bailey

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
	VelFiltStep 34	N.A.	N.A.	126-134 (SF33)	103 X
	" 35	N.A.	N.A.	118-126 (SF34)	092
	" 36	N.A.	N.A.	112-120 (SF35)	089
	" 37	N.A.	N.A.	103-113 (SF36)	073
	" 38	N.A.	N.A.	097-107 (SF37)	071
	" 39	N.A.	N.A.	091-101 (SF38)	061
	" 40	N.A.	N.A.	087-097 (SF39)	058
	" 41	N.A.	N.A.	168-178 (SF40)	146
	" 42	N.A.	N.A.	166-172 (SF41)	146
	" 43	N.A.	N.A.	162-168 (SF42)	137
	" 44	N.A.	N.A.	159-165 (SF43)	133
	" 45	N.A.	N.A.	155-161 (SF44)	121
	" 46	N.A.	N.A.	149-157 (SF45)	130
	" 47	N.A.	N.A.	143-151 (SF46)	129
	" 48	N.A.	N.A.	140-148 (SF47)	118
	" 49	N.A.	N.A.	136-144 (SF48)	108
	" 50	N.A.	N.A.	130-138 (SF49)	115
	" 51	N.A.	N.A.	124-132 (SF50)	102
	" 52	N.A.	N.A.	118-126 (SF51)	094
	" 53	N.A.	N.A.	113-121 (SF52)	090
	" 54	N.A.	N.A.	104-114 (SF53)	082
	" 55	N.A.	N.A.	097-107 (SF54)	071
	" 56	N.A.	N.A.	090-100 (SF55)	068
	" 57	N.A.	N.A.	083-093 (SF56)	052
	" 58	N.A.	N.A.	075-087 (SF57)	051
	" 59	N.A.	N.A.	069-083 (SF58)	040
	" 60	N.A.	N.A.	066-080 (SF59)	039
	" 61	N.A.	N.A.	147-157 (SF60)	125
	" 62	N.A.	N.A.	144-154 (SF61)	126
	" 63	N.A.	N.A.	141-151 (SF62)	117
	" 64	N.A.	N.A.	137-147 (SF63)	112
	" 65	N.A.	N.A.	132-142 (SF64)	102
	" 66	N.A.	N.A.	128-138 (SF65)	110
	" 67	N.A.	N.A.	122-132 (SF66)	109
	" 68			119-129 (SF67)	[illegible]

TABLE I

Tested By P.H. Bailey
Quality Assurance
Govt. Representative

Para. No.	Measurement Description	Analog Readings		Digital Readings	
		Predicted	Actual	Predicted	Actual
	VelFiltStep 69	N.A.	N.A.	114-124 (SF68)	095 ✓
	" 70	N.A.	N.A.	109-119 (SF69)	094
	" 71	N.A.	N.A.	102-114 (SF70)	082
	" 72	N.A.	N.A.	096-108 (SF71)	075
	" 73	N.A.	N.A.	091-103 (SF72)	071
	" 74	N.A.	N.A.	083-095 (SF73)	063
	" 75	N.A.	N.A.	075--089 (SF74)	052
	" 76	N.A.	N.A.	067-083 (SF75)	049
	" 77	N.A.	N.A.	060-076 (SF76)	034
	" 78	N.A.	N.A.	051-071 (SF77)	035
	" 79	N.A.	N.A.	045-067 (SF78)	037
	" 80	N,A,	N.A.	041-063 (SF79)	023
	" 81	N.A.	N.A.	129-137 (SF80)	105
	" 82	N.A.	N.A.	125--133 (SF81)	106
	" 83	N.A.	N.A.	121--129 (SF82)	097
	" 84	N.A.	N.A.	118-126 (SF83)	092
	" 85	N.A.	N.A.	113-123 (SF84)	082
	" 86	N.A.	N.A.	108-118 (SF85)	090
	" 87	N.A.	N.A.	101-113 (SF86)	089
	" 88	N.A.	N.A.	097-109 (SF87)	079
	" 89	N.A.	N.A.	093-105 (SF88)	065
	" 90	N.A.	N.A.	087-099 (SF89)	075
	" 91	N.A.	N.A.	082--094 (SF90)	062
	" 92	N.A.	N.A.	075--089 (SF91)	055
	" 93	N.A.	N.A.	071--085 (SF92)	052
	" 94	N.A.	N.A.	059--077 (SF93)	044
	" 95	N.A.	N.A.	053-071 (SF94)	036
	" 96	N.A.	N.A.	043-065 (SF95)	030
	" 97	N.A.	N.A.	034--058 (SF96)	017
	" 98	N.A.	N.A.	026--056 (SF97)	017
	" 99	N.A.	N.A.	020-050 (SF98)	005
	" 100	N.A.	N.A.	014-050 (SF99)	006
	" 101	N.A.	N.A.	106--118 (SF100)	085 ✓
	" 102	N.A.	N.A.	102-114 (SF101)	086
	" 103	N.A.	N.A.	099--111 (SF102)	077 ✓

TABLE 1

Tested By
Quality Assurance
Govt. Representative R Labriola

Para. No.	Measurement Description	Analog Readings Predicted	Analog Readings Actual	Digital Readings Predicted	Digital Readings Actual
	VelFiltStep 104	N.A.	N.A.	095-107 (SF103)	073
	" 105	N.A.	N.A.	090-114 (SF104)	062
	" 106	N.A.	N.A.	086-100 (SF105)	071
	" 107	N.A.	N.A.	080-094 (SF106)	069
	" 108	N.A.	N.A.	075-089 (SF107)	059
	" 109	N.A.	N.A.	070-086 (SF108)	050
	" 110	N.A.	N.A.	065-081 (SF109)	055
	" 111	N.A.	N.A.	059-075 (SF110)	045
	" 112	N.A.	N.A.	053-071 (SF111)	036
	" 113	N.A.	N.A.	046-066 (SF112)	032
	" 114	N.A.	N.A.	037-059 (SF113)	026
	" 115	N.A.	N.A.	027-055 (SF114)	019
	" 116	N.A.	N.A.	020-048 (SF115)	015
	" 117	N.A.	N.A.	010-044 (SF116)	000
	" 118	N.A.	N.A.	000-040 (SF117)	000
	" 119	N.A.	N.A.	000-036 (SF118)	000
	" 120	N.A.	N.A.	000-034 (SF119)	000
	VelFiltCal 121	N.A.	N.A.	>195 (SF120)	186
	" 122	N.A.	N.A.	" (SF121)	187
	" 123	N.A.	N.A.	" (SF122)	178
	" 124	N.A.	N.A.	" (SF123)	173
	" 125	N.A.	N.A.	" (SF124)	162
	" 126	N.A.	N.A.	" (SF125)	199
	" 127	N.A.	N.A.	" (SF126)	208
	" 128	N.A.	N.A.	" (SF127)	192
	+ HV (SF22)	226		TEMP 1 (117)	
	- HV (SF23)	207		2 (190)	
	HV ON/OFF (SF46)	000		3 (210)	
				4 (198)	
				5 (194)	
				6 (215)	